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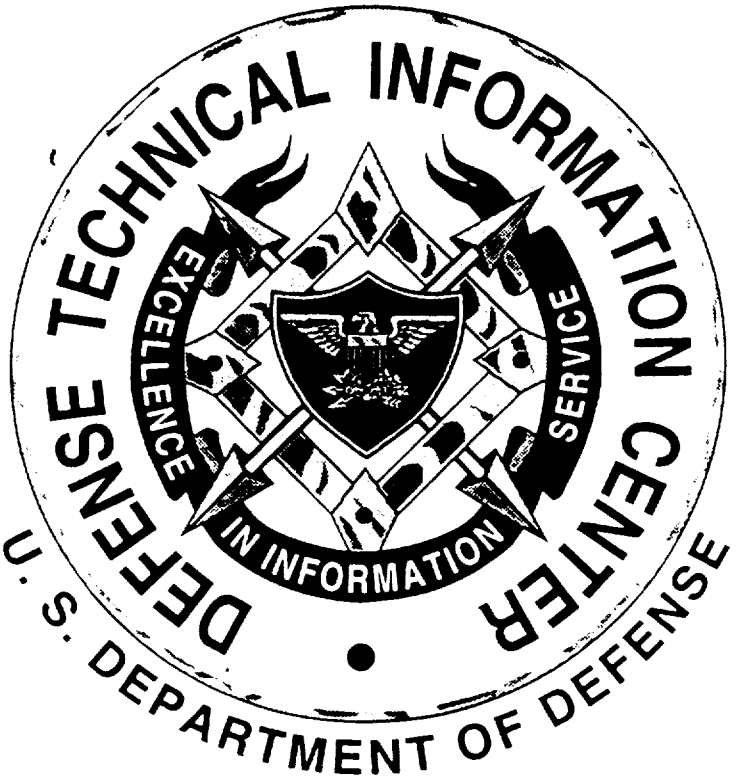

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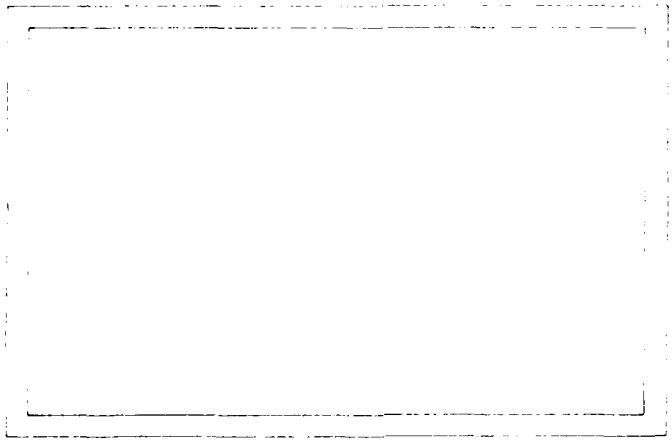

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THE USE AND VALUE OF

DEFENSE TECHNICAL INFORMATION CENTER

PRODUCTS AND SERVICES

Submitted by:

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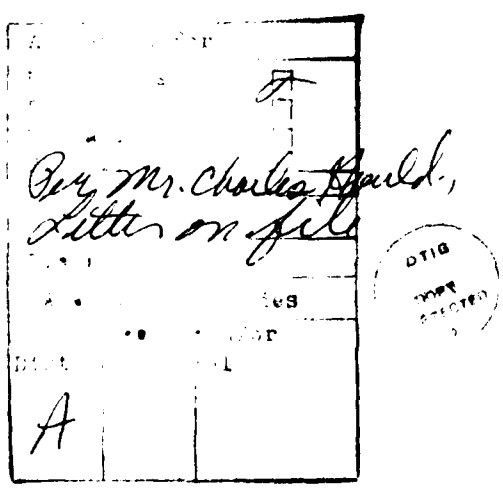

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ACKNOWLEDGEMENTS

This study was conducted as a joint effort between the Defense Technical Information Center and King Research, Inc. KRI took the lead role in designing the study and in analyzing the results as described in this report. DTIC personnel, under KRI's guidance, conducted the telephone surveys of DTIC users, edited the survey questionnaires, and did the computer processing.

A large number of DTIC staff contributed to the project. The interviewers included: John H. Dickert, T. Jane Hatton, E. Mae Long, and Alice Healy. We are especially appreciative of Karen Fox Woolridge's considerable efforts as interviewer and liaison between the DTIC and KRI staffs ensuring the smooth flow of the project work. Richard A. Mirsky also played a key role in the project by processing the survey data. The DTIC Project Monitor was John J. Glynn, assisted by Francis Sobieszczyk.

Nancy K. Roderer
Project Director

EXECUTIVE SUMMARY

This study describes the use and value of the major information products and services provided by the Defense Technical Information Center (DTIC). The products and services considered include technical report distribution on an on demand-basis and through the Automatic Document Distribution (ADD) program; secondary information dissemination through online searching of the Technical Reports (TR) data base, Current Awareness Bibliographies (CAB), and Technical Abstract Bulletins (TAB); and provision of management information from three management data banks. The amount and kinds of use of each of these products and services is addressed, as is the value associated with use.

About 1.1 million copies of Department of Defense (DoD) technical reports were distributed by DTIC in 1982. The estimated 157,000 scientists and engineers engaged in DoD research made about 12.4 million readings of DoD reports, or about 80 each on the average. Most readings were for multiple purposes, with the most common purposes being application of the report findings to a current project and professional development, current awareness or general interest. On the average, the amount of time spent reading a DoD technical report is about 100 minutes.

Technical reports read are identified through various channels, including online searching of the TR data base, use of CAB, and use of TAB. Nearly half of all DoD reports read are identified through an online search, with about 600,000 such searches conducted in 1982. About 12 percent and 6 percent of all readings came through use of TAB and CAB, respectively. There are about 25 report readings for every biweekly copy of TAB issued, and about 14 readings for every CAB copy distributed.

DTIC's management data bases include the R&D Work Unit Information System (WUIS), the R&D Program Planning Data Base (R&DPP), and the Independent Research and Development Data Base (IR&D). Uses of the three data

bases in 1982 are estimated at 280,000, with about three-quarters of the use being of WUIS. There were about 14,000 users of the management data banks in 1982, with an average of about 20 uses each.

The value of DTIC's information products and services is considered from two perspectives: that of the user, expressed in terms of willingness to pay, and that of the funders, expressed in terms of savings resulting from reading of DoD technical reports. Value is estimated at $367 million from the users' perspective. From the funders' perspective, value is estimated at $37.5 billion, 100 times the value expressed in terms of willingness to pay.

To consider the value of the DTIC products and services relative to the value of substitute services, estimates were made of the report readings that would be lost if information expenditures were fixed and other available bibliographic services were used to identify DoD reports. The value of readings lost by use of such substitutes is taken as the value of the DTIC products and services. The total value to the user measured in this way is $77 million and the value to the funder is $8.3 billion, again approximately a hundredfold increase.

These findings establish significant levels of value associated with the provision of DTIC products and services. There are substantial readings of DoD technical reports, with about 12.4 million such readings estimated for 1982. The savings value associated with an individual reading — $4,600 on the average — is high. The total value to the Department of Defense, reflecting only those readings coming through DTIC bibliographic products, is $37.5 billion. This suggests a considerable return on the investment in DTIC's information products and services.

CHAPTER 1

INTRODUCTION

The value of information services and systems to the user communities they are intended to serve is receiving considerable attention in today's climate of resource control and economic rationalization. Implicit in the Federal Government's provision of information products and services to researchers is the assumption that the use of these products and services will contribute, directly or indirectly, to the Government's mission. Questions arise, however, in attempting to pinpoint the linkages between a complex information system and research activities and in determining the appropriate types and levels of services to be provided. Other questions which arise concern how and by whom information services can best be made available.

Among the agencies facing such questions is the Defense Department's Technical Information Center (DTIC). DTIC provides information on Department of Defense (DoD) research and development activities to the Government and to DoD contractors, subcontractors, and grantees. A range of products and services are provided, including both primary and secondary information distributed in a number of forms. In providing these products and services, DTIC is concerned with the sorts of issues mentioned above and with the underlying question of benefits derived by their users. Reflecting these concerns, DTIC requested that King Research, Inc. perform a study to explore the value of their products and services. This report documents that study.

The purpose of the study was to look at the major DTIC products and services, to investigate their levels of use by DoD scientists and engineers, and to estimate the value associated with that use. The methodology used here has been developed by King Research to consider questions of value of information products and services of all types. The approach

taken is based on the premise that the value of an information product or service stems from its use, and from the subsequent application of information acquired from the product or service. Value is addressed at three levels, or from three perspectives: that of the user, the funder (in this case the Department of Defense), and of society in general. Economic models are used to estimate both the total value of information provided through a particular source and the net value associated with providing the information through one particular source rather than some other.

This approach to the measurement of value was first applied to the Department of Energy's Technical Information Center (TIC). The results of that study are documented in King Research's Value of the Energy Data Base [1]. Like DTIC, TIC provides both primary and secondary information on research and development activities to scientists, engineers and others associated with their agency's programs. Where appropriate in this report, results from the TIC study are presented for comparison with those from DTIC.

To obtain information on the use and value of DTIC's products and services, existing data on distribution and on users were first analyzed. From this, the composition of the user community was identified. Registered DTIC users are generally organizations, representing groups of individual users. Actual use data came from a telephone survey of these individuals in the user organizations, with the individuals randomly selected from among research scientists and engineers in the organization. Survey topics included general information use, use of DTIC products and services, characteristics of the last use of a particular DTIC product or service, and the value associated with that use. More information on survey methods is provided in Appendix B.

In this study of DTIC's information products and services, we looked closely at the use of information at various classification levels; that is, classified, unclassified/limited, and unclassified/unlimited. The purpose of this was to look at differential patterns of use and of value of each of these categories of material. Also of special interest in this

study was the use made of DTIC's management information data banks. There are three such data banks; the Research and Technology Work Unit Information System (WUIS), the Research and Development Program Planning (R&DPP)[1], and the Independent Research and Development (IR&D). For each of these data banks we looked again at levels of use and associated levels of value.

1.2 Value and Its Measurement

The Value of Information and Information Products and Services

Through the years our society has taken information for granted, just as it has many of our other abundant resources. Now with tremendous pressures being brought to bear on budgets and other resources, the information community is faced with increased demands to justify its expenditures and, in some instances, even its existence. Unfortunately there has been no calculus or economic theory developed to measure the value of information. This is partially because in the past there has been no pressing need to do so and partially because of the difficulty in doing so. The difficulty arises largely because of the inability to define or quantify information and to separate information from the product or service used to transmit it. In addition, the economic properties of the information (e.g., as a public good or private good) change depending on where in the information transfer process it resides (i.e., in the hands of an author, publisher, library or user).

Information generated through public funding, such as that produced through Department of Defense research and development funding, presents an additional set of issues. On the one hand information is part of what is produced through R&D efforts and the information's value is partially defined by how much it is subsequently used. On the other hand, R&D efforts are heavily dependent on existing knowledge to build upon or avoid the necessity of regenerating existing information. Conducting research

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[1] R&DPP data bank activity was discontinued in December 1982.

and development is like manufacturing a product in the sense that it is dependent on a number of materials or ingredients. Information is among the material or ingredients that contribute to research and development output. The purpose of the Defense Technical Information Service is to collect, process and provide access to information generated from DoD research and development efforts. The purpose of this report is to gain some notion as to the value of that information and the contribution that DTIC makes in providing it.

As will be shown in the next section, scientists and engineers devote an enormous amount of time to acquiring, reading and using information. The question becomes one of whether one can place a value on the use of information. King Research has attempted to look at the value of information from several perspectives; those of users (i.e., the DoD funded scientists and engineers), the DoD funders and society. The time that scientists and engineers have to conduct their work is a scarce resource since there is so much demand on it. Presumably, they make rational decisions on how to spend that time in a way that is most beneficial to their work and their own self-interest. They (or their representatives such as librarians) also have limited funds available for purchasing information products or services so that decisions to acquire these should also be made on a rational basis. From the perspective of scientists and engineers, one way to measure value is by measuring what they are willing to pay in terms of the moneys exchanged or time and effort needed to identify, locate, order, receive and use information. What they pay in these ways is called effective price in this report.

The value of a body of information such as that found in DoD reports can be measured by multiplying the average effective price times the number of times information is read (used). This might be considered a lower bound of value represented by what users are willing to pay. It is an underestimate in the sense that some users would presumably be willing to pay more. Furthermore, this lower bound of value does not include the value derived from reading information. It is shown in this report that

reading is done largely for the purposes of applying the results for conducting research, educating oneself, educating others, writing, management, etc. Each of these purposes should yield some benefits, such as saving research time and materials. Thus, additional value should be achieved through improved research results, education, writing, and management.

Considered from the perspective of scientists and engineers, value is measured in terms of the user's willingness to pay as described above. Another perspective is how the reading and use of information affect their work. Manifestations of the value of reading information are in the labor time saved; materials, equipment, travel supplies, telephone calls, etc. saved; improved research and development activities; improved education of oneself and others; improved decision making; and so on. This might be thought of as the funder's perspective. A third perspective involves how the work of scientists or engineers affects the objectives of their organizations or the goals and mission of society. Examples of such value might be how the work results in better national defense, improve balance of trade, improve quality of life, educate future scientists and engineers, improve the research and technology in other disciplines (through technology transfer), protection of sensitive information, and so on. The degree of difficulty in quantifying and measuring value is least with the scientist's or engineer's perspective, greater with the funder's perspective, and very difficult with society's perspective.

All of these measures of value presumably increase with greater frequency of use of the information. Thus, factors that led to increased use of information enhance the value of the information. Such factors include lowering the effective price of information which includes reducing the charge for information products or services as well as reducing the cost to the user of employing them; providing better information products or services; increasing awareness of the information and means of getting it; or eliminating constraints on availability of information (i.e., security classification, transborder flow, restrictions through ownership of intellectual property, etc.).

There are other factors as well which affect the value of information. For example, primary information is used only if the products or services employed to transfer it are purchased (or otherwise acquired) and used. The extent to which journals or technical reports, for example, are purchased depends on a number of factors, such as price; quality of information content, graphics, format, etc.; performance, such as speed of delivery and currency; and awareness of the existence of the journal articles and technical reports. Awareness can come in many ways, such as advertising, word of mouth, citations, just browsing, and searching bibliographic products and services, to name a few. Similarly, use of secondary information comes only after purchase or acquisition of secondary products and services, which in turn depends on price, performance, quality, and awareness.

The relationships above are shown in Figure 1, where statements of relationships are positive ones for illustrative purposes. For example, lowering effective price, increasing quality, improving performance or increasing awareness of a product or service should increase purchases (or acquisitions). Of course, subscribing to a journal does not necessarily mean it will be read. However, considering all subscribers one would expect an increased number of subscriptions will yield an increased number of readings and use of primary information. Information is used for many purposes such as education of oneself and others, research, and management. Presumably each activity will be improved through greater use and ultimately will help the nation by improving productivity, balance of trade, use of resources, quality of life, and so on.

Information is found in several kinds of documents, such as journal articles, technical reports, books, patent documents, numeric data bases, etc. In this study the focus is on the information found in technical reports. An estimate is made of the effective price and amount of reading done by DoD funded scientists and engineers. The effective price was estimated by computing user expenditures related to searching (i.e., through on-line search, use of published bibliographies, browsing, etc.), acquiring the technical reports (i.e., through personal subscriptions or

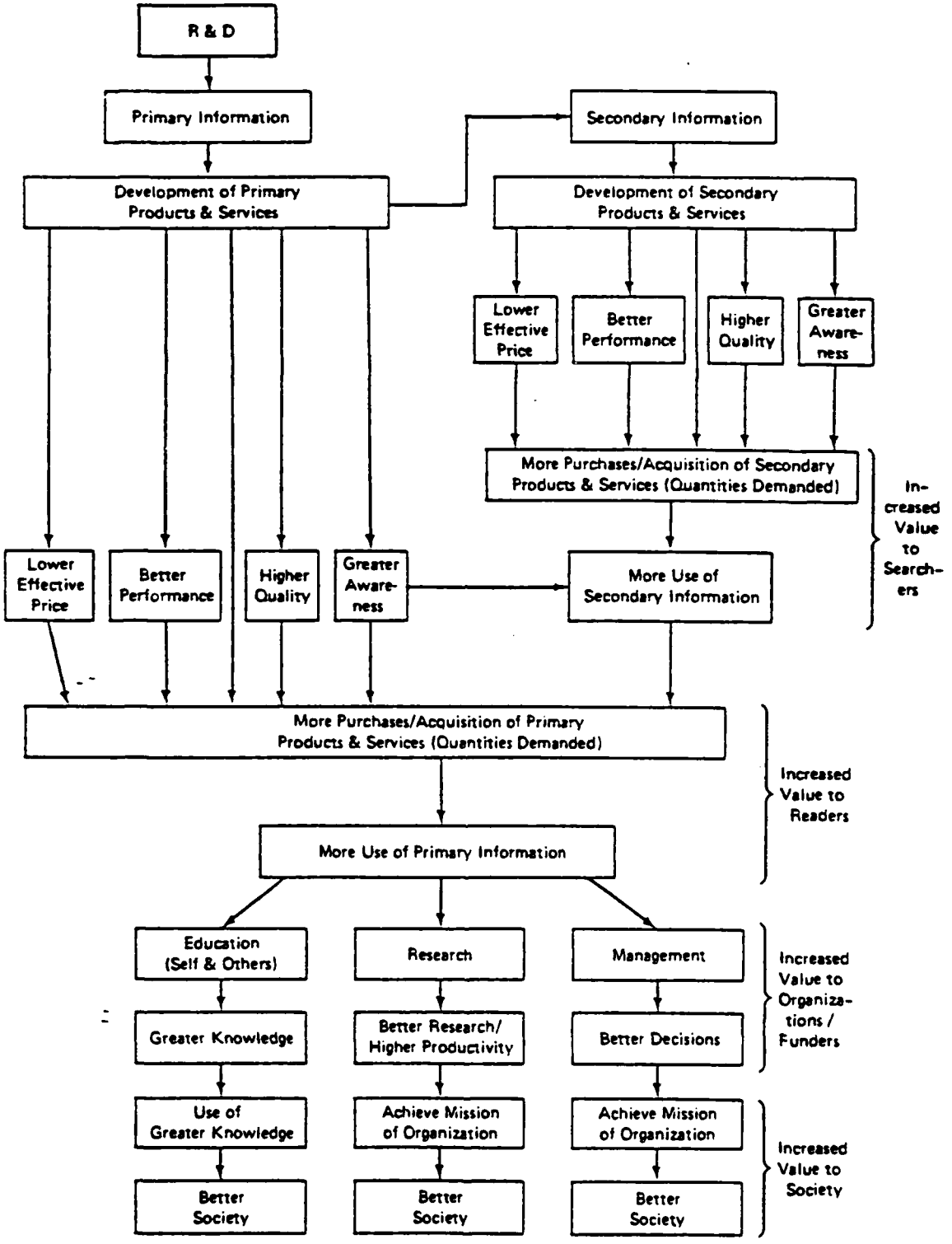

Figure 1. Factors Related to Increasing Value of Information

Source: King Research, Inc.

purchases, libraries, colleagues, etc.), and reading. The expenditures include all the labor time involved, prices paid, and costs of materials and equipment employed. These cost data were found through secondary sources (i.e., previous studies performed by KRI and others) and through a user survey. The extent of reading of journal articles and technical reports was estimated from surveys where amount of reading is associated with the varous methods of search and acquisition.

The determination of value of a specific information product or service was found directly and then by estimating the cost of substitute products or services. For example, the value of TAB was estimated by determining what the cost and likelihood are of various substitute methods of searching for technical reports. Estimates are made for the cost of searching by means of substitute search methods where the least expensive substitute is always assumed to be employed by users. A further assumption is made that the total cost of searching by all users will remain about the same regardless of whether TAB or substitute search methods are used. Thus, since the substitute search methods cost more, fewer searches would be performed and fewer readings would take place. The number of searches that can be performed under the substitute methods at the total cost is found by dividing the total search costs by the average cost of searching by the substitute methods. The number of searches lost and, hence, readings denied to users by not having TAB is computed.

The number of readings per search is estimated by observation. Thus, if fewer searches are performed, one can calculate the comparable number of readings lost because a substitute search method was employed. From this, one can estimate value computed by the change in user's willingness (necessity) to pay higher effective prices. Readers were also asked to indicate whether a specific reading of an article or technical report yielded a savings in labor time (of any of the staff), equipment, or supplies. This estimate of savings is, in effect, an indication of improved productivity yielded by reading. From these estimates, the total amount of savings lost because substitute search services would be employed is computed. These estimates provide a conservative estimate of the value

derived from savings yielded by readings resulting from TAB searches performed under existing prices. It is a conservative estimate because other benefits must also accrue. This analysis was performed for all bibliographic services provided by DTIC and for the collective services.

1.3 Overview of the Report

This report addresses the distribution, use, and value of six of DTIC's information products and services: on demand technical report distribution, automatic technical report distribution (ADD), online Technical Reports (TR) data bank searches, the Technical Abstract Bulletin (TAB) and TAB indexes, Current Awareness Bibliographies (CAB), and management information data bank searches. Chapter 2 describes these products and services and their interrelationships and indicates the level of distribution of each in 1982. In Chapter 3, on DTIC use, the users surveyed as a part of the study and their general information use habits are described. Chapter 3 then covers usage of the specific DTIC products and services, including amount of use, purpose of use, methods of identification and access, and usage per copy distributed. The value of DTIC products and services, from the perspective of users and funders, is described in Chapter 4. Fi[redacted] Chapt[redacted]marizes study findi[redacted] d[redacted] their implicati[redacted]

The Appendices to this report provide additional information on the study. Appendix B describes the methods used in surveying DoD users, and Appendix C is the survey instruments. Appendix A gives verbatim responses received from users in response to questions about how their time was saved using DTIC products and other issues.

CHAPTER 2

DTIC'S PRODUCTS AND SERVICES

The Defense Technical Information Center (DTIC) is the clearinghouse for the Defense Department's collections of research and development in virtually all fields of science and technology, involving subject categories ranging from Aeronautics to Zoology. DTIC, a primary level field activity of the Defense Logistics Agency, has the mission to exploit the contents of its collection to answer three basic questions related to the Research, Development, Test, and Evaluation (RDT&E) program of the Department of Defense (DoD). These questions are: (1) What research is being planned? (2) What research is currently being performed? and (3) What results were realized by completed research?

DTIC obtains its information from Defense and associated contractor researchers who are required to deposit information (both unclassified and classified including Secret and Restricted Data) into DTIC data bases for the subsequent retrieval for eligible users. There are four data bases in DTIC, of which three are considered management information programs. The three data bases of greatest importance to the fulfillment of DTIC's mission are the Research and Development Program Planning (R&DPP) consisting of planned research; the Research and Technology Work Unit Information System (WUIS) containing the current research being performed; and the Technical Report (TR) Program which is a formally documented collection of completed research. The remaining data base available at DTIC is the Independent Research and Development (IR&D).

The Technical Report data bank provides bibliographic descriptions of technical reports prepared under DoD funding. The data bank contains

information on over 1.1 million titles, with about 27,000 titles added in fiscal year 1982. As shown in Table 1, the titles added in 1982 included about 3,000 that were classified, 8,000 that were unclassified/limited, and 16,000 that were unclassified/unlimited. In addition to services from the Technical Reports data bank, DTIC also provide copies of the actual reports to its user community.

Research and development activities within the United States Government and their associated contractors, subcontractors, and grantees, with current government contracts, are eligible to receive most of the information from DoD data bases located at DTIC. In addition, research and development organizations without current contracts may become eligible for service by a military service authorization under the Defense potential contractors programs. There are collections, however, which contain proprietary data or information compiled for the specific purpose of DoD management decisions which are made available to Defense components only.

The information collected by DTIC is provided in a variety of forms. Technical reports are distributed both on an on-demand basis, in paper form and microfiche, and automatically through the Automatic Document Distribution (ADD) program. ADD provides microfiche copies of newly accessioned reports selected according to a user's subject interest. As indicated in Table 2, DTIC distributed over a million copies of technical reports in fiscal year 1982, 376,000 in response to on-demand requests and 722,000 through the ADD program. Both types of report distribution may be to libraries within the DoD organizations or directly to individuals.

DoD technical reports are identified by users through a number of different channels, several of these being DTIC products and services. The most frequently used method of identification involves searching of the online Technical Report data bank through the Defense RDT&E online system. Searches may either be performed by DTIC or on remote terminals linked to DTIC's central computer. The number of remote sites accessing DTIC is

TABLE 1

Technical Report Data Bank Input by Level of Classification: 1982

Level of Classification	Reports Input	
	Number	Percent
Classified	3,169	12
Unclassified/limited	8,048	29
Unclassified/unlimited	16,089	59
Total	27,306	100

Source: Defense Technical Information Center. Summary Management Data Report.

TABLE 2

Annual Distribution of DTIC Products and Services: 1982

DTIC Product or Service	FY 1982 Distribution
On Demand Technical Report Distribution	
Microfiche	109,000[1]
Paper Copy	267,000[1]
Total	376,000
Automatic Document Distribution (ADD)	
Microfiche	722,000[1]
Online Technical Reports Data Bank Interrogations	
DTIC	214,000[2]
Remote Terminals	409,000[1]
Total	623,000[2]
Technical Abstract Bulletin and TAB Indexes	60,000[3]
Current Awareness Bibliographies (CAB)	50,000[1]
Management Information Data Bank Interrogations	
DTIC	18,000[2]
Remote Terminals	51,000[1]
Total	69,000[2]

Sources: 1 Defense Technical Information Center Summary Management Data Report.

2 Estimated by King Research, Inc. based on data from DTIC's Summary Management Data Report.

3 Defense Technical Information Center estimate.

expanding rapidly; in September 1981 there were 422 terminals in the network and in September 1982 there were 541 terminals. As indicated in Table 2, there were over 600,000 interrogations of the Technical Reports data bank in 1982, with over 400,000 of these from remote terminals.

The Technical Report data bank is also used to generate subscription bibliographic products, including th Technical Abstract Bulletin (TAB), the Technical Abstract Bulletin Indexes (TAB-I), and the Current Awareness Bibliography (CAB) program. TAB is a biweekly listing of all new classified and limited scientific and technical reports received by DTIC within the processing cycle. It is available as a bound paper document, in microfiche, or on magnetic tape. As noted, TAB covers only classified and limited reports; unclassified/unlimited reports are announced through the National Technical Information Services (NTIS) publication, Government Reports Announcements and Indexes (GRA&I).

Issued simultaneously with TAB are the TAB Indexes, which contains seven indexes to the documents covered by TAB and also to unclassified/unlimited DoD documents announced by the National Technical Information Service (NTIS). TAB Indexes are provided in paper form. The 1982 distribution of TAB and TAB Indexes was about 60,000.

The CAB program provides a customized, automated bibliography service based on the recurring subject needs of DTIC users. Every two weeks, the user's subject interest profile is matched against information contained in newly accessioned documents and a listing of citations is provided in paper form. In 1982, 50,000 current awareness bibliographies were distributed.

DTIC's management information data banks include, the Work Unit Information System (WUIS), the R&D Program Planning (R&DPP) data bank, and the Independent Research and Development (IR&D) data base. WUIS is a collection of technically oriented summaries describing research and technology project currently in progress at the work unit level, including

information on what, where, when, by whom, at what costs and under what sponsorship research is being performed. R&DPP is a repository of program planning documentation at the project and task level. The IR&D data bank was designed to enhance communication between DoD scientists and engineers and their counterparts in industrial organizations. It describes technical programs being performed by DoD contractors as part of their independent research and development programs.

To make information in the management information data banks available to users, DTIC provides several categories of products and services. The data banks are available online through the RDT&E online system, which again may be searched directly from the user site or from DTIC. Approximately 70,000 interrogations of the three management information data banks were made in 1982, including 51,000 from remote terminals and 18,000 by DTIC. Searches by DTIC are provided on an on-demand basis and in the form of recurring reports compiled periodically according to a user profile and in a user-defined format.

The products and services described above are the major DTIC products, and were specifically addressed in our study. In support of its mission, DTIC also provides other products and services — among them the DTIC Digest, the Bibliography of Bibliographies, the DTIC Retrieval and Indexing Terminology (DRIT), referral services, a central registry, training programs for online system users, tours and briefings, field representation, and review of DTIC documents -- not directly covered in this report.

CHAPTER 3

ESTIMATED USE OF DTIC INFORMATION, PRODUCTS AND SERVICES

3.1 DTIC Users

DTIC's services are provided primarily to research and development activities within the United States Government and their associated contractors, subcontractors, and grantees. Such groups with current government contracts are eligible to receive most of the information from DoD data bases located at DTIC, and research and development organizations without current contracts may become eligible for service by a military service authorization under the Defense potential contractors program. Eligibility for services is determined by a registration process. With registration, organizations are provided information on the services offered and how to request them. Registration for DTIC services also assists the user in obtaining the services offered by Defense-sponsored Information Analysis Centers and major technical libraries.

DTIC also provides some limited services to the general public and to foreign requestors. Unclassified and unlimited DoD documents are announced and made generally available through a contractual arrangement with NTIS. For foreign requestors, DTIC provides assistance through correspondence and telephone contacts with the cognizant foreign embassies.

In this study, the use of DTIC services by the primary user group — DoD scientists and engineers, including those in the Federal government and those in contractor organizations — was studied. An early effort was addressed to identifying the number of organizations and individuals in this group.

About three thousand organizations are currently registered with DTIC, including some which do not make use of the services provided. At

the end of fiscal year 1982, there were 190 subscribers to ADD, 335 subscribers to CAB, and 541 terminals in user organizations able to access the RDT&E online system. The largest group of active users was the 2,041 organizations provided technical reports on demand. This group includes both heavy and occasional users of DTIC products and services; about one third of the group ordered fewer than ten reports, a third ordered between ten and fifty, and the final third ordered more the fifty.

The number of individuals within user organizations was estimated at 157,000. This is based on dividing the estimated $15.2 billion expended on DoD research activities in 1982 by an average $99,000 per researcher. Using this number, the average number of individuals per user organization can be estimated at 78. This is an average; the organizations vary widely in size. In general, it was found that user organizations with large numbers of on demand requests also had large numbers of individual users. These organizations were surveyed more heavily in this study so that each individual user would have an approxiamtely equal chance of being included in the sample.

Of the DTIC users surveyed, 52 percent were in Government organizations and 48 percent in contractor organizations. Table 3 gives the primary work role of those surveyed. As indicated, the largest group was researchers, with one-quarter engaged primarily in management. Small proportions were primarily teachers or had some other work role (such as information specialist).

3.2 Use of Journal Articles, Technical Reports and Other Materials

It is estimated that there are at least 157,000 scientists and engineers in 1982 engaged in research and development funded by the Department of Defense. This accounts for about one-fourth of the total number of 680,000 scientists and engineers engaged in R&D in the United States. Previous studies have shown that scientists and engineers (particularly

TABLE 3

Primary Work Role of Government and DOD Contractor Scientists and Engineers Surveyed: 1982

Primary Work Role	Percent of DOD Scientists and Engineers
Research	59
Management	24
Teaching	7
Other	10
Total	100

Source: Defense Technical Information Center and King Research, Inc. Survey of DTIC Use, 1982.

those engaged in R&D) spend an enormous amount of time reading. Examples of results from such studies are given in Table 4.

It is clear that scientists and engineers spend about 15 to 20 percent of their time reading the literature; about 5 percent of their time is devoted to reading journal articles. Studies by King Research show that a significant proportion of time is spent reading technical reports (9 percent in energy, 12 percent in biomedicine and 12 percent by DoD scientists and engineers). This report is largely concerned with technical reports prepared and read by Department of Defense scientists and engineers.

One of the objectives of this study was to determine whether scientists and engineers funded by the Department of Defense depend as extensively on the literature as do other researchers. In particular, the extent to which they use the information products and services provided by the Defense Technical Information Service (DTIC) was addressed.

A survey of scientists and engineers funded by the Department of Defense showed that these persons read a great deal and that they devote a substantial amount of time to this reading. These results are substantiated by other results observed in the past. The estimated average annual number of readings by scientists and engineers is given in Table 5.

The amount of reading by scientists and engineers funded by the Department of Defense appears to be about the same, as or perhaps slightly greater than, other scientists and engineers. In total, there are about 12.4 million readings of technical reports prepared under DoD funding. Of these readings, about 9.3 million were from paper copies and 3.1 million from microfiche copies.

Very few of the readings of technical reports are what one might consider to be light reading or "just to get the idea." In fact, respondents reported that 47 percent of their last readings were done with great

TABLE 4

Time Spent by Scientists and Engineers Reading Journals and Other Materials by Field of Science: 1960-1982

Field of Science	Hours per Month Reading Journals	Hours per Month Reading All Literature
Physical Sciences	9.0	
	25.1	36.8
	11.7	24.3
	4.8-11.7	
Engineers	5.0	
	19.1	45.1
	2.2-3.5	8.6-13.8
Life Sciences (cancer)	8.1	
	24.1	
Psychology	4.8	
	13.9[a]	27.7
Energy	9.8	23.6
Biomedical	7.6	27.3
Department of Defense	10.5	29.8

Sources: King Research, Inc.: Scientific Journals in the U.S., Biomedical Communication Expenditures, and Value of the Energy Data Base; Institute of Technology, An Operations Research Study of the Dissemination and Use of Recorded Scientific Information (Cleveland, Ohio: Case Institute of Technology, 1960); B. Weil, "Benefits from Researcher Use of the Published Literature at the Exxon Research Center," Paper presented at the National Information Conference and Exposition, Washington, D.C., April 20, 1977; T.D. Allen, Managing the Flow of Scientific and Technological Information (Cambridge, Massachusetts: Massachusetts Institute of Technology, 1966); D.W. King, D.D. McDonald, and C.H. Olsen, A Survey of Readers, Subscribers and Authors of the Journal of the National Cancer Institute (Rockville, Maryland: King Research, 1978); American Psychological Association, Reports of: The American Psychological Association's Project on Scientific Information Exchange in Psychology, Vol. 1 (Washington, D.C.: Americal Psychological Association, 1963); D.W. King, and N.K. Roderer, Systems Analysis of Scientific and Technical Communication in the United States: The Electronic Alternative to Communication Through Paper-Based Journals (Rockville, Maryland: King Research, 1978); A.M. Hall, P. Clague, and T.M. Aitchison, The Effect of the Use of an ADI Service in the Information-Gathering Habits of Scientists and Technologists (London: Institute of Electrical Engineers, 1972), p. 000.

[a] Computed as one-half of total literature.

TABLE 5

Average Annual Number of Readings[1] per Scientist or Engineer of Journal Articles, Technical Reports and Other Materials By Department of Defense, Department of Energy and All U.S. Scientists and Engineers: 1982

	Scientists and Engineers Funded by Department of Defense (1982)	Scientists and Engineers Funded by Department of Energy (1982)[2]	All Scientists and Engineers (1977)[3]
Journal Articles	152	118	105
Technical Reports	116	110	--
Paper Copy (DOD)	59		
Microfiche (DOD)	20		
Non-DOD	37		
Other Materials	23	--	--

[1]Respondents were told that reading meant going beyond the table of contents, title and abstracts to the body of the article or technical report.

[2]The Value of the Energy Database. Donald W. King, Jose-Marie Griffiths, Nancy K. Roderer, and Robert R.V. Wiederkehr. Submitted to the Department of Energy Technical Information Center. Rockville, Maryland: King Research, Inc., March 1982. (NTIS No. DE82-014250).

[3]Scientific Journals in the United States: Their Production, Use, and Economics. Donald W. King, Dennis D. McDonald, and Nancy K. Roderer. Stroudsburg, PA: Hutchinson Ross Publishing Company, 1981.

care and 43 percent of the last readings were done in enough depth to pay attention to the main points in the text. The scientists and engineers indicated that they spent an average of about 1.7 hours per reading of the technical reports or 132 hours on the average reading DoD technical reports over a year's duration. The average time spent reading a microfiche copy was about one hour and the average time spent reading paper copies was closer to two hours. The average time (per reading) spent reading other materials included: non-DoD technical reports, 1.7 hours; journal articles, 50 minutes; other materials, 1.6 hours. The average time spent reading by Energy scientists and engineers was 1.5 hours for technical reports and one hour for journal articles (which was about the average amount of time per reading observed for all scientists and enginers). Thus, results of the DoD survey seem to be consistent with data observed elsewhere.

The scientists and engineers were asked to indicate their primary work role within their organization. Most of them were engaged in research (59 percent) with the remainder involved in management (24 percent), teaching (7 percent) or some other role (10 percent). As might be expected, the amount of reading of DoD technical reports varies substantially by these work roles. Those engaged primarily in teaching read the most. They averaged 102 readings per year (most of which are from paper copies) compared to slightly over 70 readings per year by those involved in research and management.

In Table 6, the estimated readings per DoD-funded scientist or engineer are multiplied by the number of scientists and engineers (157,000) to obtain the total amount of reading by the group. As shown, there are over 45 million readings by the group, with 52 percent of these being of journal articles, 40 percent technical reports, and 8 percent other materials. Over one-quarter of all readings are of DoD sponsored technical reports.

TABLE 6

Total Readings of Journal Articles, Technical Reports, and Other Materials by DOD-Funded Scientists and Engineers: 1982

Type of Material	Total Readings (millions)	
Journal Articles	23.9	
Technical Reports	18.2	
DOD (paper copy)		9.3
DOD (microfiche)		3.1
Non-DOD		5.8
Other Materials	3.6	

Source: Defense Technical Information Center and King Research, Inc. Survey of DTIC Use, 1982.

Another indicator of information use is the time spent reading. Table 7 gives the amount of time spent per item and per user and the total time spent annually by all users. As would be expected, the average time spent reading a technical report (1.7 hours, or about 100 minutes) is larger than the 50 minutes spent reading a journal article. Distinguishing between paper and microfiche copies of technical reports, more time on the average is spent reading a paper copy report. The total time spent by an individual user annually is 558 hours, about 17 percent of all work time. Of this total, about 35 percent is spent on journal articles, 55 percent on technical reports, and 10 percent on other materials. About 37 percent of the DoD users time spent on reading is associated with DoD technical reports.

Table 7 also gives the total time spent reading by DoD contractors. For all types of materials, this is 56 million hours or about 27,000 person years annually.

It seems clear that scientists and engineers funded by the Department of Defense depend a great deal on technical reports and other publications for their research as well as for their management activities and their continued education. In the next section we describe how these persons identify and gain access to technical reports and the extent of the role played by the Defense Technical Information Center in these information transfer functions. Then, in the following section, we indicate the value of information found in DoD technical reports and the value added by DTIC information products and services.

3.3 Use of DTIC Products and Services

The DTIC products and services covered specifically in the survey of users included technical reports, online searches, TAB, CAB, and the management data banks. Online searches, TAB and CAB are each used to identify DoD technical reports which then provide the user with primary

TABLE 7

Time Spent by DOD-Funded Scientists and Engineers Reading Journal Articles, Technical Reports, and Other Materials: 1982

Type of Material	Reading Time (Hours)		
	Per Item	Per User	Annual Total (millions)
Journal Articles	.8	127	20.0
Technical Reports			
DOD (paper copy)	1.9	111	17.4
DOD (microfiche)	1.1	21	3.3
Non-DOD	1.7	62	9.7
Other Materials	1.6	37	5.8
Total	1.2	358	56.2

Source: Defense Technical Information Center and King Research, Inc. Survey of DTIC Use, 1982.

information on completed research. The management data banks also provide primary information covering planned and ongoing research. The use made of each of these product categories is covered in turn below.

As indicated earlier, DoD users read a total of 12.4 million DoD technical reports annually, or an average of 79 per individual. These readings are looked at for users in different organizations and work roles in Tables 8 and 9. From Table 8, the average number of readings by Government users is 63, while readings by contractors average 96. The level of reading also varies by work role with those users identifying teaching as their primary work role, reading about 50 more reports, on the average, than researchers or managers. The average number of reports read by researchers and managers was about the same.

In order to read a technical report, a user must first find out about, that is, identify it, and then obtain a physical copy. In some cases these two activities of identification and access occur simultaneously, as for example when a report is received through some sort of standard distribution and identified by the user as being of interest. For the most part, however, identification and access occur separately. Tables 10 and 11 give breakdowns of the total DoD report readings by identification and access channels.

In Table 10, the identification methods shown include online bibliographic searches, printed indexes, CAB, citations in reports or journals, colleague referrals, reports routed to users, and other. The most frequently used of these is the online bibliographic search, which accounts for nearly half of all readings. For the most part these are searches of the Technical Report data bank using the RDT&E system, with searches performed either by the user's organization or by DTIC.

Users may also identify technical reports through TAB and CAB, two other DTIC products. In combination with online searches, use of these

TABLE 8

Annual Number of Readings of DoD Technical Reports by Government and DOD Contractor Scientists and Engineers: 1982

User Category	Annual Technical Report Readings	
	Average	Total (millions)
Government	63	5.2
DOD Contractor	96	7.2
Total	79	12.4

TABLE 9

Annual Number of Readings of DOD Technical Reports by DOD-Funded Scientists and Engineers in Four Work Roles: 1982

User Work Role	Annual Technical Report Readings	
	Average	Total (millions)
Research	68	6.3
Management	72	2.7
Teaching	105	1.2
Other	142	2.2
Total	79	12.4

Source: Defense Technical Information Center and King Research, Inc. Survey of DTIC Use, 1982.

TABLE 10

Annual Number of Readings of DOD Technical Reports by Government and DOD Contractor Scientists and Engineers by Identification Method: 1982

Identification Method	Annual Technical Report Readings	
	Number (millions)	Percent of Total
Bibliographic Search		
Done by Organization	5.1	41
Done by DTIC	.9	7
Printed Index		
TAB	1.5	12
Other	1.0	8
CAB (Current Awareness Bibliography)	.7	6
Citation in a Report or Journal	1.1	9
Colleague Referral	1.0	8
Routed to User	.5	4
Other	.6	5
Total	12.4	100

Source: Defense Technical Information Center and King Research, Inc. Survey of DTIC Use, 1982.

TABLE 11

Annual Number of Readings of DOD Technical Reports by Government and DOD Contractor Scientists and Engineers, by Distribution Method: 1982

Distribution Method	Annual Technical Report Readings	
	Number (millions)	Percent of Total
Standard Distribution to Individual	.5	4
Standard Distribution to Library	.2	2
Ordered by Individual	.6	5
Ordered by Library	10.2	82
Other	.9	7
Total	12.4	100

Source: Defense Technical Information Center and King Research, Inc. Survey of DTIC Use, 1982.

identification channels yield a total of 66 percent of all readings identified through DTIC products or services. Identification through other printed indexes, which accounts for 8 percent of all readings, involves the use of NASA's STAR, NTIS's GRA&I, and other publications. In total, about three-quarters of report identifications involve a bibliographic product or service, with the remaining quarter made up of identification via citation (9 percent) colleague referral (8 percent), routing (4 percent) and other means (5 percent).

Table 11 breaks down the total report readings by distribution channel. There are many ways (or channels) through which copies of the technical reports are distributed including:

(1) Directly to individuals through standard distribution.

(2) To individuals through libraries that obtained copies through standard distribution.

(3) Directly to individuals through their ordering it from DTIC.

(4) To individuals through libraries that obtained copies by ordering them for the individual or someone previously.

(5) Through other means such as a colleague, the National Technical Information Service, etc.

By far the greatest proportion of readings, over 80 percent, is of reports ordered by libraries. In total, 87 percent of readings are of reports ordered on demand, 6 percent are of reports received through standard distribution, and 7 percent are accessed through other means.

Table 12 compares the number of readings from standard and on demand distribution with the number of copies of reports distributed via these means. Data on both distribution and readings apply to 1982. Strictly speaking, they cannot be combined to yield the average readings

TABLE 12

Estimated Readings per DOD Technical Report Copy Distributed
by Distribution Method: 1982

Distribution Method	Number of Copies Distributed (thousands)	Number of Readings (millions)	Average Readings Per Copy
Standard Distribution	722	.7	1
On Demand Distribution	376	10.7	28
All Methods	1,098	12.4	11

Source: Defense Technical Information Center and King Research, Inc. Survey of DTIC Use, 1982.

per copy because not all readings of reports distributed in 1982 will occur in 1982 and not all readings occurring in 1982 will be of 1982 reports. Since the levels of distribution and reading are fairly constant over the years however, we can combine the data to approximate readings per copy. The result shows about one reading per copy for standard distribution (all microfiche) and 28 readings per copy for on demand distribution (30 percent microfiche and 70 percent paper copy). In total, there are about 11 readings of DoD technical reports per copy distributed. This can be compared with an estimated 1.1 readings per technical report copy distributed by the Department of Energy and .1 readings per article copy distributed for scientific and technical journal articles generally.

Report readings can also be categorized according to the level of classification of the report, that is, classified, unclassified/limited, or unclassified/unlimited. This is done in Table 13. Almost 60 percent of report readings are of unclassified and unlimited materials, with about 20 percent each for classified and limited reports respectively. The 20 percent of readings being of classified reports can be compared to a similar percent for on demand distribution of classified reports (most readings come through on demand distribution), suggesting that the number of readins per copy distributed is similar for classified and unclassified reports.

Why do DoD scientists and engineers read technical reports? General categories of purposes are to support education, research, and management. In the survey of DoD scientists and engineers, users were given the opportunity to indicate one or more purposes for their last reading of a DoD report. On the average, users mentioned about four purposes. As shown in Table 14, the most frequently acknowledged purposes were application of a report findings to a current project (75 percent) and professional development, current awareness or general interest (74 percent). About half mentioned application of the report's methodology to a current project, use for citation, and use in preparing some publication. Comparing

TABLE 13

Annual Number of Readings of Classified, Unclassified/Limited and Unclassified/Unlimited Technical Reports by DOD-Funded Scientists and Engineers: 1982

Level of Report Classification	Annual Technical Report Readings	
	Number (millions)	Percent of Total
Classified	2.6	21
Unclassified/Limited	2.6	21
Unclassified/Unlimited	7.2	58
Total	12.4	100

Source: Defense Technical Information Center and King Research, Inc. Survey of DTIC Use, 1982.

TABLE 14

Proportion of Scientists and Engineers Funded by the Department of Defense and Department of Energy Who Indicated Various Purposes of Reading DOD Last Read Technical Reports: 1982

Purposes of Reading Last Read Technical Reports	Proportion of Yes Responses (%)	
	Department of Defense	Department of Energy
Educational		
Self -- For professional development, current awareness or general interest	74	75
Others -- In preparation of a lecture or presentation	39	40
Research		
In preparation of a research proposal	27	38
To apply its findings to a current project	75	77
To apply its methodology to a current project	53	50
In preparation of an article, book, review or report	49	50
As a citation in an article, book, review or report	50	48
Management		
For the planning, budgeting and management of research	33	40
Other	6	--

Source: Defense Technical Information Center and King Research, Inc. Survey of DTIC Use, 1982.

the purposes of use of DoD reports with those of DOE reports, also shown in Table 14, suggests very similar patterns of use for the two groups.

Table 15 further describes DoD report readings by indicating the depth to which each report was read. As suggested by the average reading time of 100 minutes, most reports were read either with great care (47 percent) or with attention to the main points (43 percent). Ten percent of readings were made just to get the idea of the report.

To look at DoD scientists' and engineers' utilization of DTIC bibliographic products and services in more depth, separate survey sections addressed online bibliographic searching, use of TAB, and use of CAB.

As indicated earlier, online searches may be performed by DTIC or by the user organizations, increasingly in recent years by the latter. In 1982, as shown in Table 16, about two-thirds of the interrogations made of the Technical Report data bank were made by user organizations. In total, over 600,000 interrogations were made. DTIC estimates that there are, on the average, about three interrogations per search.

When a search is performed, multiple citations to reports of potential relevance are obtained. The average search of the TR data bank, according to users, yields about 170 citations. This is narrowed down by the user to a number of titles deemed relevant. For the average DoD user, the number of relevant titles per search is estimated at 39, or about one-quarter of the titles output from the online search.

Not all reports identified as relevant are actually obtained by users, and not all reports obtained are read. For the average search, with 39 reports identified, 15 reports are accessed and 10 read (see Table 17). It is the case with DoD users, as with scientific and technical users generally, that the number of readings resulting from an online search is greater than that resulting from a printed index search.

TABLE 15

Number of Readings of DOD Technical Reports by Reading Depth: 1982

Reading Depth	Number of Readings (millions)	Percent of Readings
With Great Care	5.8	47
With Attention to Main Points	5.3	43
Just to Get Idea	1.3	10
Total	12.4	100

Source: Defense Technical Information Center and King Research, Inc. Survey of DTIC Use, 1982.

TABLE 16

Number of Online Interrogations of the Technical Reports Data Bank By DTIC and by Other Organizations: 1982

Searching Organization	Interrogations of the Technical Report Data Bank
DTIC	214,000
Remote Site	409,000
Total	623,000

Source: King Research, Inc. Estimate based on DTIC's Summary Management Data Report

TABLE 17

Number of DOD Technical Reports Identified, Accessed and Read as a Result of an Online Search: 1982

	Number per Search	Percent of Reports Identified
Reports Identified	38.7	--
Reports Accessed	14.7	38
Reports Read	11.8	30

Source: Defense Technical Information Center and King Research, Inc. Survey of DTIC Use, 1982.

Online searches may be performed directly by the user or by an intermediary such as a librarian. In the case of searches of the TR data base, 95 percent of all searches were performed by someone other than the end user. Thus, when users were asked about the amount of time spent searching, the bulk of the time reported was associated with making the search request and with reviewing search output. As shown in Table 18, a total of 2.4 million hours were spent on online searching. This is about 15 hours per user or almost four hours per search. Considering only the items read as a result of the search, about 25 minutes were spent by the user for each item that was ultimately read.

Another means of identifying DoD reports is through a TAB search. In 1982, there were an estimated 1.5 million uses of TAB, or an average of 9.5 per user. This is 25 readings for every biweekly copy of TAB distributed.

TAB and TAB Indexes are used by a smaller proportion of the user population than are online searches, about 30 percent of the population as compared with 65 percent. Among users of TAB, more than half had used the publication within the last two weeks (probably the last biweekly issue). About half were browsing when they used TAB, and about half conducted a problem-related search. These data seem to suggest that TAB uses are about equally divided between current awareness purposes and retrospective subject searches.

The average number of items identified as relevant through a TAB search is about 14. As shown in Table 19, about six of these titles are subsequently accessed and about two are actually read. The low percentage of reports read is probably because so many of the searches were very recent; users were asked to indicate completed rather than planned readings.

The average time spent on a TAB search was reported by users as about 45 minutes. This is about 20 minutes per item read, as compared with

TABLE 18

Time Spent on Online Reports Searches by DOD-Funded Scientists and Engineers: 1982

	Time Spent (Hours)	
	Per Search	All Searches (millions)
Requesting and/or Conducting Search	.5	.3
Reviewing Search Output	3.3	2.1

Source: Defense Technical Information Center and King Research, Inc. Survey of DTIC Use, 1982.

TABLE 19

Number of DOD Technical Reports Identified, Accessed and Read as a Result of a TAB Search: 1982

	Number per Search	Percent of Reports Identified
Reports Identified	13.5	--
Reports Accessed	5.6	41
Reports Read	2.3	17

Source: Defense Technical Information Center and King Research, Inc. Survey of DTIC Use, 1982.

25 minutes for online searching. Total time spent on TAB searching by all users was 1.1 million hours

DTIC's CAB program provides a customized, automated bibliography service based on the recurring subject needs of its users. The service is bi-weekly. At the end of 1982, there were 335 CAB subscribers including both individuals and institutions. About 9 percent of DoD users, or an estimated 14,000 individuals, report having used CAB within the last year. Each of these reported 22 uses on the average, for an annual total of 314,000 uses. These uses resulted in about 700,000 readings.

As implied by its title, CAB is used mostly for current awareness. With 26 bi-weekly copies distributed per year and 22 uses reported, it appears that most users are regular users. The results of an average CAB use are given in Table 20: about five titles identified as relevant, three titles accessed, and just slightly fewer titles read. In part, the high proportion of reports identified that are actually read is probably due to the broad, current awareness focus of CAB.

For online, TAB and CAB searches, DoD users were asked to indicate a breakdown of reports by classification level. This was done for both reports identified as relevant and for reports read. The purpose was to look for different identification patterns for different classification levels.

As shown in Table 21, somewhat different breakdowns by classification level were observed for reports identified and reports read. More significant, however, were the differences between online searching, TAB and CAB use. Nearly half of the reports read as a result of a CAB identification were limited, which was true of only 20 percent of reports identified through TAB and 7 percent of those identified by an online search. Reports identified through an online search were more likely to be unclassified and unlimited than with either of the other two bibliographic products.

TABLE 20

Number of DOD Technical Reports Identified, Accessed and Read as a Result of a CAB Use: 1982

	Number per Search	Percent of Reports Identified
Reports Identified	4.5	--
Reports Accessed	3.0	67
Reports Read	2.7	60

Source: Defense Technical Information Center and King Research, Inc. Survey of DTIC Use, 1982.

TABLE 21

Comparison of Classification Level of DOD Technical Reports Identified and Read as a Result of Online, TAB, and CAB Searches: 1982

Identification Method and Classification Level	Percent of Reports Identified	Percent of Reports Read
Online Search		
Classified Reports	15	30
Unclassified/Limited Reports	20	7
Unclassified/Unlimited Reports	66	63
TAB and TAB Indexes		
Classified	51	30
Unclassified/Limited Reports	14	20
Unclassified/Unlimited Reports	35	50
CAB		
Classified	18	15
Unclassified/Limited Reports	28	44
Unclassified/Unlimited Reports	54	41

Source: Defense Technical Information Center and King Research, Inc. Survey of DTIC Use, 1982.

Table 22 compares the readings identified through DTIC bibliographic products with those from other sources. Looking at the total report readings from online searching, TAB or CAB, we find 29 percent classified, 12 percent unclassified/limited, and 59 percent unclassified/unlimited. For other identification methods, the proportions are 5 percent classified, 38 percent unclassified/limited, and 57 percent unclassified/unlimited. The bulk of readings of classified reports come from identifications via a DTIC bibliographic product, while limited reports are more likely to be identified by some other means. Both categories of identification methods are equally likely to result in reading of an unclassified and unlimited report.

In addition to services associated with its Technical Reports data bank, DTIC also maintains and provides services from its three management data banks: WUIS, R&DPP, and IR&D. One hundred thirty-one users responded to the management databank survey conducted as a part of the project. WUIS users totaled 72 (or 55 percent of databank respondents), R&DPP users totaled 24 (18 percent) and IR&D totaled 35 (27 percent).

Table 23 shows the number of uses of DTIC management database by scientists and engineers. For the R&D Work Unit Information System (WUIS) the respondents' uses totaled 207,000 with an average of 1.3 uses per year. For the R&D Program Planning Data Base (R&DPP) there were 50,000 uses per year with an average of .3 uses per respondent per year. The Independent Research and Development Data Base (IR&D) respondents reported 23 thousand uses per year with an average of .2 uses.

The survey respondents were also asked: "Did you pass the information you obtaind on to anyone else?" The average number of pass-ons (Table 24) per WUIS user was 4.1. The R&DPP database users reported an average of 2.3 pass-ons while IR&D users averaged 3.1 pass-ons of information from a particular search.

TABLE 22

DOD Technical Report Readings by Identification Method and Report Classification Level: 1982

	Classification Level		
	Classified	Unclassified/ Limited	Unclassified/ Unlimited
All Readings (Millions)	2.6	2.6	7.2
Proportion of Readings (%)	21	21	58
Readings Identified through DTIC Bibliographic Products[1] (Millions)	2.4	1.0	4.8
Proportion of Readings (%)	29	12	59
Readings Identified through Other Means[2] (Millions)	.2	1.6	2.4
Proportion of Readings (%)	5	38	57

[1] Includes online searching of the TR data bank, TAB use, and CAB use.

[2] Includes use of other bibliographic products, citation, colleague referral, routine, and other.

Source: Defense Technical Information Center and King Research, Inc. Survey of DTIC Use, 1982.

Table 23

Annual Number of Uses of DTIC Management Data Banks
by DOD Scientists and Engineers: 1982

Data Bank	Annual Uses Average per year	Annual Uses Total (thousands)
R&T Work Unit	1.3	207
R&D Program Planning	.3	50
Independent R&D	.2	23
TOTAL	1.8	280

Source: Defense Technical Information Center and King Research, Inc. Survey of DTIC Use, 1982.

TABLE 24

Number of Pass-on Uses of DTIC Management Data Banks: 1982

Data Bank	Average Pass-On Uses
R&T Work Unit	4.1
R & D Program Planning	2.3
Independent R&D	3.1
Total	3.7

Source: Defense Technical Information Center and King Research, Inc. Survey of DTIC Use, 1982.

The usefulness of DTIC management data banks was investigated (Table 25). Ninety-four percent of the users queried reported that the results of the search were useful while only 6 percent felt that the data was not useful. Of the R&DPP users, 83 percent found the results useful and 17 percent did not. A majority of the IR&D users also said the results were useful (90 percent) with only 10 percent reporting no use. The reasons for usefulness as reported by users are listed in Appendix A.

Completeness of the information found during the user's searches was also measured (Table 26). Seventy-one percent of WUIS users said "yes" whie 14 percent said "no" and 15 percent did not know. Sixty-two percent of R&DPP users said "yes," 17 percent said "no" and 21 percent did not know. Of the IR&D users, 72 percent found the information complete while 11 percent did not and 17 percent responded "don't know."

Overall, nine percent of the DoD researchers and engineers surveyed used DTIC's management data bases. This is about 14,000 users, not including those to whom the information is passed on. Since a total of 280,000 uses are estimated, the average number of uses per user is 20. When asked about future use of the management data banks, current users anticipated modest increases in usage over time.

TABLE 25

Rating of Usefulness of DTIC Management Data Banks: 1982

Data Bank	Were Results Useful (Percent)	
	Yes	No
R&T Work Unit	94	6
R&D Program Planning	83	17
Independent R&D	90	10
Total	92	8

Source: Defense Technical Information Center and King Research, Inc. Survey of DTIC Use, 1982.

CHAPTER 4

ESTIMATED VALUE OF DOD INFORMATION AND DTIC INFORMATION PRODUCTS AND SERVICES

4.1 Value In Terms of Readers' Willingness to Pay for Information

In Section 3, it is found that DoD scientists and engineers devote a substantial amount of their time acquiring, reading and using information found in DoD technical reports. When this time and effort is expressed in terms of expenditures, it is found that they are willing to pay a great deal for the information. The estimated effective price that they actually pay is found in Table 26.

Thus, the total value that DoD users are willing to pay for information generated by DoD is estimated to be about $560 million or an average of about $3,600 per scientist and engineer. The amount of this value directly attributable to the use of DTIC products or services (i.e., TAB, CAB or computer searching) is estimated to be about $370 million or an average of $2,300 per scientist and engineer.

These values do not take into account that DoD scientists and engineers could identify and obtain their information in ways other than TAB, CAB or DTIC bibliographic searching. To obtain the effective price with alternate means of searching, costs for the specific identification method (from Table 26) are added to the general purchase, processing, access and reading cost. For example, the cost of manually searching by other means is estimated to be $75.40 rather than $49.90 for TAB and $44.90 for CAB, and substitition for DTIC computer bibliographic searching is estimated by $51.10 instead of $43.50. (See reference [1] for details on how these substitutes costs are estimated). Value of each of the products and services is estimated below by calculating the cost of changes in searching practices resulting from withdrawal of a product or service. It is assumed that a given amount of expenditures will be made by a user (or

TABLE 26

Effective Price of Reading DoD Technical Reports by DoD-Funded Scientists and Engineers: 1982

Cost Category	Average Per Reading ($)	Number of Readings (Millions)	Total Value to Readers ($ Millions)
Report Purchase	$ 0.10	12.4	$ 1.2
Processing	3.30	12.4	40.9
Identification			
TAB	12.30	1.5	18.5
CAB	7.30	0.7	5.1
Search	5.90	6.0	35.4
Other Announce. Pubs.	30.70	1.0	30.7
Other	0	3.2	0
Access	5.60	12.4	69.4
Reading	28.60	12.4	354.6
TOTAL	$ 44.80	12.4	$555.8

Source: King Research, Inc.

his representative) for searching and reading. In the case of TAB the total expenditures is $74.9 million (i.e., 1.5 million readings from searches times $49.90 per reading). If a substitute method of searching costs more then, in order to maintain the $74.9 million fixed expenditures, fewer readings would be possible. In this instance there would be about one million readings instead of 1.5 million readings from TAB searches. The value lost in terms of the scientist's or engineer's willingness to pay would be about $25 million. Similarly, the total amount of CAB expenditures is $31.4 million and the number of searches possible at $75.40 would be about 400 thousand instead of 700 thousand. Thus, the value lost in this instance would be about $13 million. Finally, the total value of bibliographic searching by computer is $261 million and the number of searches possible using substitutes is 5.1 million instead of 6 million so that the value lost in this instance is about $39 million. The total amount of value lost (in terms of willingness to pay) comes to about $77 million for the DTIC bibliographic products and services (TAB, CAB and computer searches). These numbers are all considered to be lower bounds on the amount of value achieved through use of the DTIC bibliographic products and services.

4.2 Value in Terms of Savings

In the survey, respondents were asked to indicate the amount of savings that were achieved by them as a direct result of having read a DoD technical report (i.e., their most recent reading of a technical report. These savings can be considered a measure of the value of information to the funders. The average such savings stated by the survey respondents was $4,700 per reading; where about 85 percent of the readings of technical reports yielded some savings. These savings involved label and equipment as typified in the following statements:

TABLE 27

Value of TAB, CAB and Computer Searches in Terms of Willingness to Pay by DoD-Funded Scientists and Engineers: 1982
($ Millions)

	TAB	CAB	Computer Searching	Total
Total Readings	1.5 million	0.7 million	6.0 million	8.2 million
Average Value in Willingness to Pay	$ 49.90	$ 44.90	$ 43.50	$ 45.70
Value Directly Attributable to Product or Service	$74.9 million	$31.4 million	$261 million	$367 million
Readings Lost by Substituting	500,000	300,000	900,000	1,700,000
Value Found by Substituting for Product or Service	$25 million	$13 million	$39 million	$77 million

Source: King Research, Inc.

- o DTIC provided some needed information on who was involved in a program and gave foreign contacts.

- o Because of the nature of the information, some data can be found only through DTIC and therefore is priceless.

- o The information gleaned from the search gave insight into something the researcher had not thought of before. Provided insight into the problem.

- o Gave the contractor an idea of what Department of Defense was interested in.

- o Saved in writing and research time since someone else had tested the information already.

All such responses are listed in Appendix A of the report. It is noted that results observed with Department of Energy scientists and engineers were somewhat lower on the average. DOE scientists and engineers indicated an average savings of about $1,280. They reported savings for about 75 percent of the readings of technical reports.

The total value to funders, measured in terms of savings achieved through the 12.4 million readings of DoD technical reports, is estimated to be about $58 billion. The amount of this attributable to technical reports read as a result of using TAB, CAB and bibliographic computer searches is about $37.5 billion. The value of savings to funders found by substituting bibliographic products and services for TAB, CAB and bibliographic computer services is estimated to be about $8.3 billion. These data are summarized in Table 28. Like all of the estimates of value derived in this Chapter, these figures represent value realized in a particular year (1982) from use

TABLE 28

Value of TAB, CAB and Computer Searches in Terms of Savings to Funders by DoD-Funded Scientists and Engineers: 1982

	TAB	CAB	Computer Searching	Total
Total Readings	1.5 million	0.7 million	6.0 million	8.2 million
Average Value in Savings	$ 5,600	$ 5,500	$ 4,200	$ 4,570
Value Attributable to Product or Service	$ 8.4 billion	$ 3.9 billion	$25.2 billion	$37.5 billion
Readings Lost by Substitution	500,000	300,000	900,000	1,700,000
Value Found by Substituting for Produce or Service	$ 2.8 billion	$ 1.7 billion	$ 3.8 billion	$8.3 billion

Source: King Research, Inc.

of the total DTIC data base, that is, the cumulation of the reports and bibliographic records processed over the years. Thus the investment necessary to generate these levels of value includes both 1982 expenditures and earlier expenditures on collecting and processing the DTIC collection.

The Defense Technical Information Center also provides information from management data banks as mentioned in Sections 2 and 3. Relative to the completeness and usefulness of the data in the data banks, users were asked to place a value on staff time and equipment and supply costs saved by using the DTIC management databanks as shown in Table 29. Eighty-one percent of WUIS users found they saved money by using the databanks showing an average of $2,600 per user per search. Eighty-eight percent of R&DPP users saved an average of $3,600 per user per search and finally, 74 percent of the IR&D users saved $3,900 on the average.

Overall, 9 percent of the survey respondents used management information reports. It is estimated, therefore, that there are approximately 14,000 uses in total at an average savings of $2,900 per search. The total yearly savings resulting from management data bank use is thus $73 million.

4.3 Value Associated with Levels of Document Classification

To this point, the value associated with technical reports has been discussed for all DoD reports, regardless of their classification level (classified, unclassified/limited, or unclassified/unlimited). An important issue, however, is the extent that classification has on extent of use and hence on value.

In Section 3 it was indicated that 3,169 titles in FY 1982 were classified, 8,048 were unclassified but limited and 16,089 were unclassified and unlimited. However, the number of readings in 1982 of classified technical reports was 2.6 million readings compared to 2.6 million for unclassified/limited and 7.2 million unclassified and unlimited. This means that the average number of readings per title (recently announced) is about twice as high for classified reports (820) as unclassified/limited (323) and unclassified/unlimited (448). Even though the average number of

TABLE 29

Average Value in Terms of Savings of DTIC Management Data Bank Uses: 1982

Data Bank	Proportion With Savings (%)	Average $ Savings Value
R&T Work Unit	81	$2,600
R&D Program Planning	88	3,600
Independent R&D	74	3,900
Total	82	$2,900

Source: King Research, Inc.

readings per title may be higher because many of the 2.6 million readings of classified technical reports were of older titles (i.e., older than 1982), the data do suggest that the amount of reading of classified reports is greater than that of unclassified ones. Thus, the value of classified reports in terms of willingness to pay and in savings is also likely to be greater. In fact, it is found that the average value in terms of savings is substantially higher for reading classified technical reports than unclassified/limited or unclassified/unlimited reports as shown in Table 30.

A further, and perhaps, even more important question is how much value is lost because of the constraints imposed on classified technical report distribution and resultant loss of readings. This question cannot be answered directly, although some evidence can be shown. It is found that nearly all readings of classified technical reports come from reports that are identified by DTIC bibliographic products or services, whereas about one-third of the readings of unclassified and unlimited technical reports are identified by other means. This suggests that an additional (at least) one-third readings would be made of classified technical reports if there was greater awareness of them. If this assumption is correct, there would be about one million additional readings of classified technical reports at an assumed average value in terms of savings of $8,600. This comes to an additional $8.6 billion in value attributable to classified technical reports or $5.1 billion if the readings of classified technical reports replaced the readings of unclassified and unlimited technical reports. This analysis, while based on a number of assumptions, does support substantial value may be lost by restricted announcement and distribution of classified technical reports. Phrased in another way, potential losses in reading and value are costs which must be balanced against the other kinds of benefits which accrue from classification of DoD reports.

TABLE 30

Average Value in Terms of Savings of DoD Technical Report Readings by Level of Report Classification: 1982

Report Level of Classification	Average Savings Value
Classified	$8,600
Unclassified/limited	2,400
Unclassified/unlimited	3,500
Total	$4,700

Source: Defense Technical Information Center and King Research, Inc. Survey of DTIC Use, 1982.

APPENDIX A

RESPONSES TO OPEN-ENDED QUESTIONS

Answers to Open-Ended Questions

Question: **"Were the results useful for that purpose? Why?"** (See page C-2.)

Some information 2-3 years old gave some contacts in field.
Provided one study on topics and added to other information obtained.
Gave some info he wasn't knowledgeable of.
Gave info contributing to pallets.
This organizations needs to know about work in progress and work completed to avoid duplications of work with other organizations.
Picked out individual sites for possible audit.
Did not show any work being done in area. Project got funded — got info wouldn't otherwise have.
I did find relevant documents.
To avoid duplication of effort. To save travel time and money and to help defend the NASA budget.
It helped me avoid duplication of work effort made by others. It helped me write a Military Standard on Logistics Models.
It helped me avoid duplication of effort with other organizations engaged in similar work.
Enabled search to obtain documents on the subject.
Gave me the needed info to begin Law program.
Several documents were pertinent.
Received info to pass on to others.
Gave info on Ceramics for high temperature and everyone was happy about the report.

Report abreast of present technology.
Made manager more aware of relevant data.
Much of info was several years old.
Did indicate a certain trend, but the data was truncated and did not give the latest figures.
Material was current.
Report useful to this immediate group and an engineering group.
Received needed info for proposal.
Gave update of methods and dealt with problems on subject, gave needed info as to where to find other info.
Some items didn't show up, but was partially useful; didn't use all key words.
Now I only have one piece of paper instead of multiple copies or pieces.
Accessions were applicable to our project.
Called author and got report, which is useful.
Helped to identify the ongoing work and other agencies also working on same subject.

Negative, found nothing.
Work with vague out of date and inaccurate not complete.
Except time it takes to obtain follow on reports from DTIC. Can call author.

What you do-assessment of research-apply to Public Law 9648.
Wrote an IOM on subject as a result of the search.
Other obligation presented.
Question of no info. Perhaps definition of terms was incomplete.
Useful, but much he repeated with parameter search.
Gave broad based background, speeds up research.
Gave significant literature background for in-house development and publication.
Nothing on behavioral.
Provides info that probably wouldn't otherwise. Have to assume studied program is complete and consider all available info research.
Gave broad index for this field.
Sound relevent info-obtain leads for use in project.
We were getting ready to do our own searching and did not have to.

No info found .
Is it a real program? Some deemed essential, some non-essential-like to match what they can do with what services need.
Provided insight into problem.
Some programs indicate we can modify equipment to make it of interest to the
company.
Provided the info I needed.
No info in data base.
Especially for future purpose. Info for 1st system minimal. Very helpful for next system.
Provided what others were doing-who was active in field.
Applicable but request was cancelled.
Very helpful-DTIC did a good job-received a lot of info.
Gave info to group-however some info old.
Fulfilled req.-didn't locate info., so let contract.
Gave several studies done in field.
Found info on what others were doing.
Said what other people were doing and gave foreign contacts; but wanted more up-to-date info.
Not up-to-date.
Provided source info that could be used and contacted.
Sole service available.
Gave extensive info on how to reduce costs.
Gave status of items being worked on in labs and confirmed what already knew and gave additional insight.
Provided needed background info.
Able to find some areas on interest and where funding was.
Large listing of info.
Found info useful in finding out what Defense was interested in.
Gave info needed.
Identified other companies/agencies who are doing research.
Very satisfied with DTIC personnel-but didn't get all info needed-
Keywords are a problem.

Need more advance info-however report confirmed this info wasn 't available.
Good source for current research-is combined RDPP-WUIS search.
Got otherwise nonfindable soource of info.
Provide useful info in fulfilling requirements of contracts-provide excellent background info.
They were applicable to the info. I needed.
Gave up-to-date info.

Gave more tnan needed- but got info needed.
Confirmed what company was going to do- very supportive.
Because there is very little studies available on Lantirn.
Alot of background from others' research.
Knowledge of related industry studies and gives leads to contact.
Because it outlined work done by others and they used it to analyze their program.
Gave several company contacts and info.
Several relevant citations were included in results.
We are building a new theoretical model and several searches were received and applicable.
There were several pertinent references-was quite helpful.
Yes, the results were very useful and several documents were relevant.
I was able to use the info I received.
Material included was indeed updated info.
We are working on a project and needed all avail. info.
Dave needed info on what was involved in program- gave contacts-described program.
Assisted in study.
Gave specific info as to the contact and budget info.
It detailed work being done.
Insight into something they had not thought of.
Too broad scope.
Received sufficient background data for her report.
Some of what he was doing had been done before.
Gave necessary history of present torpedo work and appreciation for what is going on. Don't know-hasn't finished reading and collecting data.
Found references I would not have found otherwise-other contacts were made available to me.
I got some info that was useful.
A lot of leads- but no documents that were ordered ever came.
Data seemed insufficient for the search in question-Data was used in other efforts.
There were some relevant cites in the document.
"I did not receive any pertinent info from DTIC."
Pertinent Info.
Helped link other info concerning state of the art in Millimeter Wave Technology.
Any bit of info is useful.
Several pertinent searches were received.
Small amount available.

Pertinent References.
Found reports he hopes will be useful. Has not had time to fully study.
Because it was pertinent to my requirements.
He was disappointed in the small amount of material.
Helpful in providing what info was available.
We found that little was being done in the subject-need to do more.
Identified number of similar R&D efforts-
showed work not being done elsewhere.
Gave knowledge of other power sources for army study.
Gave needed background info.

Question: "Could you describe how it saved you time?"

Would have had to perform search on own.
Would have had to get library to search other sources.
Would have had to get library to search other sources.
Would have had to perform search in other areas-i.e. library, other systems.
Manual search - UCLA had M17 saves some time; 1/2 hour versus days time.
Would have had to perform library searches & contact personnel to gather info. Only used report as back-up & no significant savings resulted - probably wouldn't have searched info if not available through DTIC TRs.
Had to repeat research with all its mistakes to find the right answer.
Very difficult to find their type of work through any other source.
They haven't saved time but has added to his research effort.
Also searches STAR, stlil has to find out material from other sources. Gets a lot of data by word of mouth.
Saved them from constructing research that was done before.
Would have to search for info elsewhere & some info not available anywhere besides DTIC.
Would have to search info elsewhere.
Had to spend time looking elsewhere.
We would have to spend time travelling to other areas plus searching for the info.
Relieves us from lots of searching elsewehere.
Many hours of hand searching.
Searching through the library.
Many hours digging manually.
Time searching manually.
Would have had to make a thorough literature search.
Don't know.
Needs material within 1 to 2 days-Most DTIC materials arrive too late to be of use except in confirming their findings to a problem.

Able to respond quickly to corporate headquarters in LaJolla, California.
Manually searches indexes in open literature. Allows good background material which they would not have had time for otherwise.
Saved literature searching time.
Able to respond faster to needs of our research group.
Turn-around time is faster using DTIC.
Make decision of info needed, then go out to recreate info, after search was made for other sources.
Saved time by not having to recreate data.
This was ordered for a potential contract. If they get the contract for developing a product, they could realize savings of $100,000 toward that development.
Put subject in direct contact with needed info-settle a technical issue.
No savings compared to the terminal, but gives me time to browse & gave a broader outlook.
Material could not be found elsewhere so fast.
Saved literature searching time when DROLS computer terminal was down.
Turnaround time is fasdter using DTIC.
Results are more complete and data is more quickly accessed than elsewhere.
Saved literature searching time.
TAB used as backup when DROLS computer down.
Turnaround time is faster using DTIC service. Provided info that we didn't currently have.
Finding reports in TAB saves time- Reduces the number of places to look. Over the course of a project, the documents involved can save $15,000 on $3,500,000 project.
Gave additional references to P___ Info.
Did not need to order these reports. Already knew data contained in these reports. Normally it does give new info.
By not having to spend time doing library research, etc.
In doing my own travelling and searching.
Researching through library.
Not having to repeat the research that was done.
Planning time and time in developing procedures.
Did not have to leave work area for research.
Research time.
Discovered that the work had not been done. Beginning of a new project.
It was negative information/still alot of work to be done on this project.
We were able to get the information.
Not a technical report in specific, but a assessment of technology-not possible to put a dollar value on.
Sole source of information-only place to get it.
Went to other documents for the particular information.
TAB is only source of information.
Did not have to repeat research. Had a reliable source of information.
It gives one a better view of the problem. Documents found quickly.
Don't have to go through all journals. Don't have to go through companies.
Time spent going elsewhere, and checking with other colleagues.
Did not have to duplicate research. Data was there.

Don't have to do mechanical search, but at this time it does not seem that survey is complete. Needs to change search strategy.
Not address the subject.
Would have had to go to library and search for information.
Would have had to perform own research.

One centralized source for much information.
Two weeks of computational work.
More research needed.
Would have had to "Re-invent the wheel".
I got it promptly when I needed it most.
The entire system was down and I needed a quick response.
I did not have to look through all literature sources to find what I wanted.
We might have lost out on an RFP of we hadn't gotten the information promptly.
The computerized on-line system was not operating and I needed to reach promptly.

We did not duplicate listing and research which had already been done.
It saved my having to search all the literature.
Reduced research time, freeing me for other tasks.
Had to have done research himself.
Make more phone calls.
Time spent not having to do research.
Two-Three days of work saved not having to do the search elsewhere.
Would have had a lower quality product because he would no have had this info . Since most of what he uses is classified, would have been difficult, if not impossible, to get info elsewhere. By having DTIC's reports available, didn't have to go elsewhere to find info.
Didn't have to go elsewhere to find info.
Library would have to search.
Know about info that wouldn't have known about otherwise- may not have had the info available.
Would have had to contact individuals in this area and have discussions with them.
Time and travel to do research by other methods.
Telephone interviews and traveling.
Would have had to look for other bibs. and libraries and spend time doing personal research.
Was able to see methodology that could be applied- didn't waste time using methodology that didn't work.
Time saved in having terminal instead of going to DTIC with key words.
Don't know yet how reading reports saved time.

Would not have had most of info-has not been successful in locating materials in past.
Would have called agencies if knew who to contact-DTIC is irreplaceable
DTIC is necessary to his work-could not be duplicated therefore.
Travel time for moving plce to place & time for searching.
Searching.
We were relieved of doing our own searching.
We would have had to do our own searches.
Our time was saved by someone else doing the looking.
Time spent searching.
Staff did not have to devote time to searching.,
Not having to do our own searching.
We would have spent several hours doing searches.
Not having to do our own research for revelant subject matter.
Travel & not having to do our own searching through volumes of other material.
Doing research.
We would have had 3 or 4 other people working, searching for these reports.
By not having to do our own searching.
The last report one read was not applicable, however when they are, I save time by not having to look for info elsewhere.
Would have had to look through other references-textbooks other info.
Would have had to write a computer program to obtain the analysis after digging up the material.
Finds work already done and people to contact.
Relevancy 90% vs. 0% - 1%. Keep up a leading edge of state-of-the-art.
Would have called government agencies..
I read about it and was able to identify it promptly.
Would have developed it or gone without-probably the latter.
Would have researched other sources such as NTIS, chemical societies.
Would have used other data bases or manual search of literature.
(Hasn't received items yet).
Would have had to do alot of basic work, with uncertainty and risk in securing findings.
Added to the base of knowledge for this project.
Speeds up time in finding materials.
We were able to respond promptly to a DOD request for proposal.
It saved search etime response becasue our computer terminal was not operational.
We were able to obtain contracting and subcontracting leads.
The data was not readily availabl eelsewhere.
Information was readily available to take advantage of a DOD procurement invitation
Saved searching time.

It is not readily available elsewhere. We could not operate so well without DTIC products Keep up with the state-of-the-art and can work more effectively.
Would have contacted people in field for reports.
Would have done own search or performed library search.
No other way to get the information.
A void in this particular area saved time and transit.
It helped us react promptly in preparation of a research proposal.
We would have to duplicate test results and we were able to decide that we also wanted the classified reports.
Saved time having to look elsewhere.
Would have had library search from other sources.
Library would have done searches from other sources.
Would have completed job on own knowledge/experience and perhaps go to experts in field.
Would have completed on own knowledge/experinece aknd perhaps go to experts in field.
Would not have gotten the info.
Would have gone to library to secure some of the info.
Would have gone to the library to secure some of the info.
Would have used other indexes- would have taken the same amount of time that DTIC does, however he prefers our service because it gives him more info.
Would have used other indexes- would have the same amount of time that DTIC does; however, DTIC gives more info.
Would not have had access to info.
Search time.
We did not have to spend our time searching.
By having DTIC identify relevant abstracts.
The searching for relevant documents.
By not having to do our own searches.
Telephone calls, direct contact, etc.
Trips, telephone calls, etc.
Time saved in getting document easily.
Look at CAB at getting something extra; not as a savings- would not get material otherwise.
Did not have to go to many other soruces to get the same info.
The CAB saves the manual work offuinding the documents, may of hwichcould be missed.
Need to find info. elsewhere.
This research is done as if a personal SDI-is the only way he searches-
Does not have idea of how long it would take to get this info in other manners.
Collection of data that would have had to have been gathered from may other sources.
Do not have to write to research groups to get the info.
Need to have gone back to the source study.
Getting material eliminates reinventing the wheel.

Having automated searching speeds up finding the documents.
Would have gone to organization who issued report.
Would have generated info himself.
Would have canvassed other services for info./reports.
Would have used other databases/reports-he uses broad resources.
Would have contacted individual people.
Would have used other search methods in library
Survey type report-lot of research bibs-did alot of initial sorting.
Done for a special project.
Have to get data from other sources-report quite comprehensive.
Documents used to complete fact sheet on data needed in 24 hours. Would have taken much longer to find data wanted on short notice.
Have access to info so research was not repeated.
Showed that the work had not been done.
Someone else has developed a concept.
Time saved in reduction of searching.
Make us aware of current trends.
Would have contacted Federal agencies and contractors-but wouldn't have equivalent info.
Would have called Federal agancies and/or contacted contractors.
Info was delivered promptly by library so that briefing was prepared on time.
Material was not available elsewhere and were very specific.
Titles were available promptly for my briefing.
Material was probably available. Saves time designing instructional materials.
We did not have to provide secondary distribution of our own handbook.
Saved search time becasue DROLS computer was down.
Brought us up to date on current concepts.
Background material.
Time saving in searching through TAB-critical for doing research- However, TAB is not very complete on the Behavioral Scieinces. Feeling that it is an excellent service.
Would have made personal contacts in his field of interest.
Would have gone to author to secure report.
Would have gotten a contractor to secure info.
Would have used private databases or gone to universities.

Would have performed studies personaly.
Hasn't received reports.
Would have contacted authors after lengthy search for report titles.
Did not have literature searches.
Time saved by getting reports- No idea of how long it would take to get reports otherwise.
Do method of evaluating time saved. Still in training.
Turnaround time is faster using DTIC products.
Saved time because DROLS computer terminal was not operating.
We were able to respond promptly to the researchers request.
Turnaround time is faster using DTIC products and services.
We are six to eight weeks ahead of schedule using CAB.
We could not have found it elsewere.
Saved time because the computer terminal was down.
Turnaround time is faster using DTIC services.
Turnaround time is faster for us using DTIC.
Turnaround time is faster for us using DTIC.
Would have'reinvented the wheel"-contacted people in field of interest.
Reduced time involved-enabled to get info quickly.
Narrowing down the search- Having to use other sources.
Gives outside contacts for further info.
Would have called other activities involved in some area of interest to get reports.
Would have called agencies for info.
Would have searched for people in the field to speak with.
Would have to research different Agencies for information- cal, travel.
No response.
Expect report to save time in giving much background information for future research.
A case of looking for information. Information is not available through other suorces.
Would have searched in "open" literature.
Would have contracted other sources such as people he knows in the field.
Would have been "lost" without the services-significant time to secure info from other sources if ever possible.
Would have been "lost" without the services-time to secure info from other sources if ever possible.
Would have used info- not that critical to work.
Would have gone to agency involved to secure info/report.

Would have called other agencies for reports or performed research.
Conclusion led them to drop filers as a program. This could lead to enormous savings.
Don't have to do a alot of running about to find reports.
Classroom reading-will probably add time of the student.
Better defined a research topic.
CAB saves time in not having to track down these documents (citatoins) each week.
Additional research material that was essential to task. Did not have to recreate data of report.
Would have contracted out to acquire info.
Wouldn't have used that info in projects.
Would have gone to report source to acquire info (if known) otherwise would do without.
Would have contacted government agencies of people in field of interest.
Would have contacted government agenies for info/reports.
Would have contacted a local university.
Time saved in method of accessing report.
The reports are the job- Quickness of access saves time-2 days work saved in not having to walk through bib. material (Savings at 1st Lt at 2-4 year salary).
Would have conducted interviews.
Report is stlil to be read- will require alot of time.
Would take up to a week of time to find the reports which the CAB gives him.
Saved him from having to perform the same work.
This is saving given is on search time saved by finding bibligraphic online.
Saved the drudgery of a difficult manual search.
Would have not been aware of the nifo- would have performed own search.
This is his work.
Depends on savings of preventing the need for future research.
we were able ot respond promptly to our research staff needs.
This type of intelligence was not readily available elsewhere.
Travel time to do searching- also spending time on manual searching.
Identifying from the abstracts available.
Manual searching.
DTIC did the work.
Applied to future planning and professional awareness.
Enables him to get needed info in a short period of time. Enables him to be more productive- get more info.
Would have to do manual- manual search probably would have taken a month.

Would not be accessible without on-line database set up the way it is.
May have saved someone down the line time.
Did not have to do manual search.
Did not have to duplicate research.
Not having to duplicate research. Time saved in identifying additional references in each report.
By not having to search elsewhere.
Time spent on researching.
Didn't have to find the info elsewhere.
Having DTIC do the research for us.
By having the research done for us.
By having DTIC doing the researching, and travel time also.
We are all spoiled by using the computer- do not have to research in library.
Travel to get reports.
Gain info- making a point.
Haven't gotten data yet, so can't evaluate. Data in past has been fruitful.
This is for a gain in material, not a savings of time. Work provided info.
All work done by staff and aides. He does not pay any attention to it.
Did not have to recreate processes of establishing the methods of research.
Info readily available.
Did not have to repeat research- could be from 2 to 10 man-years of work.
Only place where the research is available. Can't make estimate about the time it takes to get these things.
Quicker to do, much more accurate.
Contribution to project.
Didn't have to visit the source.
Given much better background on U.S. capabilities. How to direct efforts toward foreign technologies.
Read to broaden knowledge.
Can find out what is done.
Otherwise have to do less productive and more time consuming research-mainly interested in military application.
Try to set up definition themselves, then get it approved.
Where to find available info.
Add value to the project.
Did not have to spend time that a manual search would have taken.
Did not have to recreate research.
Design our survey and acquire results to use on projects.
Some of the info would not be directly available and would have to contact other organizations for info.
Would have had to call other organizaitons for information/materials.
Research field of study & probably result in duplicate effort. Wouldn't have the opportunity to build on someone else's work.
Would have had to go to the Records center to search records for answer.
Have to go to library and research and review articles.
Call originating agency- how to obtain.
Would have a lower level of technology and be ignorant of info in this-

would have had to perform our research but would not have obtained total info.
Go to specialist at Lockheed-This would have reuqired a trip.
Items to be found at one spot.
Not a savings of time but a gain of information.
This was an initial search to see if info on abstracts would show problems of finding things, as current key words did not match the aproved DRIT list.
In conjunction with another report could respond to a Logistics need
Summary without survey of 20 other reports.
Did not have to contract search out.
Value given to the providing of info. Material not known to exist elsewhere.
Without research aids such as this, valuable data would be missed.
Haven't done reading. Can save time only if another has something new to offer.
Computer does the work. Need to repeat research and look at a lot of other places.
Did not have to go elsewhere- data easily provided. Make more efficient use of time.
Had a read access to the material.
Item used to keep aware of current state of research in the field.
Still examining materials to begin project.
Did not have to reconstruct a war game.
TAB is a source- without it he would not know work exists.
Although more work has resulted, time was saved by not having to search for materials.
Would have had to go to Washington, D.C. and perform search and would take 2-3 days.
Would have had to go to library and perform search of materials.
Not read yet.
Would have had to duplicate most of repots on research library for ohter sources of info.
Not having to do the research.
Do our own research.
Reading was a gain of data; used to find other reports from bibiliography.
Did not have to make trips to get documents. Bibliographics there to check off against current holdings.
Would have to go to other source to get information through commercial access- more time consuming, more expensive.
Did not have to duplicate research.
TAB acts as a good source of info.
Wouldn't have gotten all the info but would have searched in library.
Spend time in library searching for information.
Go to library or other suorces to find info.
Go to other sources for info.

There is a much greater speed of researching on our data team.
Would have used ERIC data base.
Provided extra info for the project on hand. Did not have to recreate a search.
Documents found at a single location.
Wouldn't have known about reports- because they're limited- probably wouldn't have info- but would do some library research.
It gives him a convenient, quick summary of what is current, but he insists it does not save him time or nmoney.
Saved literature searching time.
Material could not be found elsewhere.
Saved literature searching time.
Spend the hours of basic research plus put it together.
Short time to get classified info.
There were delays in the initial ordering process. Report enabled this research to be up to date and not repeat research. Can also learn successful techniques.
May have saved 1 say-possibly 5 weeks time.

Question: "What did you and your staff save as a result of that reading? (See pages C-7, C-8.)

Readily available information.
Time from looking for other sources
Time
Spend time learning about answers to particular problems.
Don't know six months of trial and error.
Not yet arrived- will save time if they live up to their abstract
Did't have to do the work described in report.
Time.
Time.
Time.
Time/Money.
Time.
Time.
Time.
Time.
Time.
Time and Money.
Time and Money.
Time/Money
Time/Money.
4 days of Effort.
2 days on each.

Answered a question.
Time/Money.
Time and Money.
Time and Money.
Locating information.
"Why do you ask these questions- it is an obvious consideration that any very recent search would not yet have produced documents. Also are we placing value on the BIB or on the documents themselves."
Got more info.
Time.
0.
Time/Money.
Time.
Time/Money.
Time/Money.
Planning time and Time in Deveoping procedures.
Time and Money.

Nothing.

Used in preparing Handbook.

Time.
Saved "Re-inventing the wheel".
Time saved.

Time.
Time- did not have to "re-invent the wheel".
Time & Money.
One hour.
Manhours and Money.
One hour.
Time and money.
$30.
Completeness.
Hours of time.
Got results from what others have already done.
By having DTIC's reports available, didn't have to go elsewhere to find info.
Didn't have to go elsewhere to find info.
Library would have to search.
Gained access to something they didn't know about.
Would have had to contact individuals in this area and have discussions with them.
Time.
Time.
40 hours.

Saved personal time in searching info in library.
Was able to see methodology that could be applied- didn't waste time using methodology that didn't work.
Could not get info otherwise.
Time.
Time.
Time and Money.
Time and Money.
Time.
Time.
Time and Money.
Time and Money.
Time and Money.
Time and Money.
Time and Money.
Could do other things; one week of searching elsewhere.
Plagarize Analysis.
Work already done- have to meet.
Time.
Money//Manhours Time/Cost.
Time.
Time.
Better quality reports.

Time and Money.
Time and Money.
Time and Money.
Time and Money.
Time and Money.
Time.
Time.
Invaluable—no other source.

Time and Money.
Time and Money.
No answer.
Time and Money
Time and Money.

Confirmed prior knowledge.
Time.
Time.
Time.
Time.
Time.
Time.
Time and Money.
Time.
Time.

Time.
Time.
Personal Time.
Time/Cost.
Time/Cost.
Saves patrons time.
Cost.
Time.
Cost- Too lengthy time.
Gave answer.
Time and Money.
Time.
Got info probably wouldn't have acess to.
Time and Money.
Time and Money.
Time and Money.
Time.
Time.
Time.
Time.
Time.
Time/cost
Time.
"This is the same result as for Part I" (no result given in part I.)
Time and Money.
Time and Money.
Time and Money.
Time and Money.
Time and Money.
Time and Money.
Time and Money.
Cost.
Cost.
Reduced time involved- Enabled to get info faster.
Time.
Time.
Time.
Time.
Time.
Time/Costs.

Time.
Time.
Cost.
Personal interest.
Time.
Time.
Cost and time to do our own research.
Cost and time to do our own research.

Using TAB saves time in finding documents.
Cost/Time.
Had info readily available.
Better effectiveness.
Better effectiveness.
Time.
Time.
Time.
Time.
Time/Cost.
Cost.
Time and Money.
Time.

Time and Money.
Time.
Article Screened ahead ofTime.
Tremendous amount of Time.
Time.
Develop, development of computer models.
Saved time.
Time.
Time.
Time.
Reliabiltiy and credibility.
Got graphs of VS technologies.
Endless hours of figuring things out when the material is available in literature 2 years of work.
Not available if not found here.
Better job with info.
Good info.
Familiar with areas of interest.
Made info available for instructional purposes.
Design our survey and acquire results ot use on projects.
Time Duplicate effort.
Several months.
Time.
2 to about 20,000.
Time.

Information.
0.
5% of effort that would be expended elsewhere.
Presented a good simulation- saved several months.
Although more work has resulted, time was saved by not having to search for materials.
Actions/projects have resulted from reading report.
Reports were used for browsing only and savings haven't been realized yet.

Time.
Not read yet.
Time.
Gives info.
Cuts down or second guessing-better factual basis for making decisions.
Time.
Gave info to complete projects-saved time.
Time.
Made organization more efficieint-time saved.
Time.
Avoided duplicate effort and used their recommendations.
Time/Money.
Time/Money.
Research time.
Indispensable, essential access in short time work being done.

Question: We are interested in your use of reports provided by DTIC. Can you tell us what report you read last? Title: (See C-6.)

Anaylsis of future development witn in Air Force.
Plasticity.
High speed bearings
Don't Know.
Gas Chromotography.
Active Aperture.
Development and Utilization of Integrated and Multi-dimensions salary.
Group on forecasting methods for defense contractors.
Infrared Detection Unit.
Surveillance: Navy Fleet, Fire Exiting. Cartridge.
Mechanical Properties of 70/50 T-73.
Fracture Toughness Data for Disc.
Nuclear Fuel Reprocessing.
Radar Signal Processor.
Warsaw Pact Logistics Planning Guide.
Development of a Low Cost EMP Protection for Ops. Ctrs.
Models for Warfare at Sea.
Management Engineering Plans for Secure Communications.
Communications Control and Security.
MultiSource Data Integration for real time Aircraft ID.
Results of French Nuclear Testing.
Microwave Circuit Analysis and Synthesis.
Navy Research and Development 1982.

Electrooptics Tecnology.
Field Purification of Water of BX.
Directs Evaluation of al Test Helmut Mounted Site.
Air Base Survivability Workshop.
Army Report on Chemical Warfare.
1978 Defense Science Board Survey.
Approach to Test Plan for Aircraft Operation in a Toxic Environment.
Measurement of Film Cooling Effectiveness in short duration Wind Tunnels.
Description of Major results of Air to Ground Visual Recognition.
Diffuser Science Board Summary Study in Technology.
Infrared Decoy.
Recent Development in High Performance Ceramics.
Fracture Mechanics.
Evaluation of Duplex Whiskered Silicon Nitride Structure.
Condidate R & D Thrust for R & D Initiative.
Projectory Reconstruction Progress.
Maintaining Ability Verification/Demonstration Evaluation.
Characteristics of Nettle Vapor.
Handbook of Insructional for Non-Deductive Testing of Materials.
Flight Safety.
On-Line Systems.
NAVSTAR Global Postioning System.
Security,Privacy, National Vulnerability
Cryogenic Alloys.
Antenna.
High Spot Project.
Laser Communication.
Firefight 2 Model.
Defense of ships.
Artificial Intelligence.
Artificial Intelligence.
Sensitivity Analyses of Platform in Target Location.
Reflectivitiy Measurements witn 10.6 Micrometer Infrared Radiation.
Lasers.
Literature Surevey of Physical and Chemical Properties of Agents.
Military Organization, Readiness and Sustainability.
Microwave Radioactive.
QUICK Simulation Model.
Fiber Optic Couplers.
Projectile Characteristics.
Aluminum Coatings.
Designs for Control of Projectile.
Aluminum Alloy Technology.
Environment Storage, Test of NATO 7-62.
Tactical Systems in Technology.
Tactical Warfare.

A Programmable Wide Band Pseudo Random Coded.
Radar Detection, Analysis for Map of Earth, Helicopter Flight.
A Survey of Underwater Models.
Communications.
Ship Defense Systems ADT.
Hydrazine Detection.
Slide Rocket Proponents.
Nuclear propulsion.
Superplastic forms-Aircraft
Documenttion of Software in the OL-192 program.
Very High Speed Integrated Circuits.
Journal of Insrumentation and Control.
H.S.I.C.
Journal of Defense Research.
Pulsed Laser Effects.
Chemistry Reflection change of a copper surface.
Dive control.
Subminiature Electronic Equipment.
CC Intelligence.
FFT Algorithms.
Microstructure-Nickel Base Alloy.
Propellants-Munitions.
Cavitation of Pumps.
Peparation of Radiation-Adhesive Bonding.
Aerothermodynamics.
Investigation of Cold Cathodes for Long Life CO_2 Wave Guide Lasers.
Infrared Countermeasures.
Feasibility of Fuse for Small Caliber.
Air Cushion Vehicles.
Electrical Vehicles.
Infrared Analysis of Land Combat Vehicle and Land Background.
Effect of Laser on Army Optics.
Pershing Missile.
Interior Ballistics.
Pulse Laser.
Shaped Charges.
Interrelationship of Rock Properties.
Land/Mine Warfare.
Elastic Scattering.
Anti-air Homing Missiles.
IDA Report-Effect of Weather Hanover FRD on electroopitcal imaging sys.
3 Dimensional Computation -Target Interaction.
Cost Analysis.
Development of Archives for Existing Data Bases.
USAF Avionics Plan.

Technology of space Based Radar.
Analysis of Training Management.
Leadership Criteria for Army Instructors.
Library Handbook.
Survey of Performance Effectiveness Measure.
Shaped Charges.
Missiles.
Laser Effects.
ADA (Computer Language).
Target Vulnerability-Munitions.
Defense Repression.
Environmental Implications of Ground Based Airborne Hydrogen Flouride Laser Operation.
Radar.
Airlift Operations.
Library Handbook.
AFFIT These (Bibliography), Military Retirements.
Mine Countermeasures.
Electromagnetic Pulse.
Linear Shaped Charges Mine Fields.
Summary Report on German Research on Swept Wing.
Acoustics.
Soviet Import Controls.
Tactical Electronics System.
Diving.
Foreign Support.
Penetrating Munitions.
Status of Research on Infrared Fiber.
Materials Vulnerabilty of US-an update.
Damage Assessment Verification Study.
Vacuum Voltage Breakdown as a Thermal Instability of the Emitting pultrusion.
Circular Polarized Static RCS Patterns.
Synthetic Radar.
Operations Analysis.
Aerothermodynamic heating.
Multi-band Antennae System.
Natural Lnaguage Processing.
Command and Control.
Joint Acquisition of Weapon Systems.
Chemical Warfare.
Projection Pursuits.
Self-forging Fragment Calculation.
(ARSV) Armored Reconnaisance Scout Vehicle.
Magnetics.
Fire Control System for M-1 Tank.
Allocation of Military Resources.
Advance in Naval Architecture.

White Phosphorous.
Tactical Nuclear War at Sea.
Design Requirements of the ASWS Standoff Weapon.
Software Cost Estimating.
Expert System- Newest Branchild of Computer Sciences.
Wide Angle Drive Transmission for Hydrocoil Patrol Craft.
Distributed Data Processing.
Incentive Contracts.
Contract Incentive.
NBSR81-23.42 Fed. Sol. Program Users Manual.
Test of Satellite Terminals.
Dry Oil Battery Usage.
Development of an All-Metal Thick Film Cost Effective.
Metallization for Solar Cells.
Desert Water Problems.
Human Performance in Continuous Operation .
Fuel Cells.
Avation.
Decision Support Systems.
Cost Growth in Defense Acquisition.
Africa.
High Power Millimeter Wave Ampliter.
Tank Fire Control.
Multiple Attribute Decision Analysis model.
Matrix Management.
List of Data Sources.
Program Management Information Systems.
Foreign Air Cushion Vehicles.
Soviet Bloc Capabilities.
Don't Know.
Vaccine Trials.
Casualty Study.
A O Threats Scenario.
ACOSS (Control of Space Structures)
Assessment of Acceptability of Digital Speech Communication Systems.
Is the US Prepared for its next conflict?
Guide for Transitioning Army Missile Systems from Development to Production.
Electro-Metric Determination of Metals etc.
Computer Technology Forecast and Miliary Acquistions System Process.
Maintenance and Diagnostics.
Chemical Warfare in Central Europe.
Fault Action of Equipment.
Heliopter Rotor Down Wash-Tests.
Aircraft Dynamics.
Tabular Aids for Fitting Widral movement esculant.
A Simulation Model for Reliability, Availability, Maintainability (RAMA) of Amphibian Assault landing craft.

Chemical Stimulant.
US/Soviet Strategic Balance in '80- Can We Meet the Challenge
Base Contracting Procedural (2 vols.).
Operations Research -0 Career Field.
Human Dimensions-Protective Clothing.
Instructional Technologoy.
Truck Driving.
Imagery and Learning.
Naval- Blue-Green Single Pole Downlink Propagation Model.
Corrosion - Prevention in Tactical Vehicles.
Logistics Support at the Corps level.
Potential for Conflict in Latin America.
Jet Flow Phenomena.

Question: "What was the general subject of the last search of the DTIC database you performed or had performed for you?" (See page C-10.)

Plasticity
Video Disk and CAI
Group on Forecasting Methods for Defense Contractors
Infrared Transmission of Optical Materials
EHF communications
Moving Target Indicators
Warsaw Pact Logistics Planning Guide
Test Report on PLRS (Position Locating and Reporting System)
Undersea Warfare
Monopults
Security Classification Management
Submarine Simulation
Russian Translations on Communications Security
Underwater Survival
Microwave Electronics
Command and Control Systems
Acquisition
Effects of Chemical Toxicants on Airplane Materials
Absorption Phenomena
Tig Fusion Spot Repair of Resistance of Defective Spot Welds
Laser Window Materials
Fracture Mechanics
Navigation of Course Missiles
Non-Destructive Exam of Ceramic Materials
Flight Safety
Computer Communications Security
Navigation Satellites
Geophysical Prospecting and Site Selecting
High Altitude Platforms
Navy Transit System
Command and Control
Sensitivity Analyses of Platforms in Target Location
Reflectivity Measurements with 10.6 Micrometer Infrared Radiation
Technology in Weapons System
Towee Arrays
Integrated Optics
Projectiles
Shaped Charges
Passive Sonar Signal Processing
Rocket Propellants
Compression of Solid Rocket Propellants
Nuclear Propulsion
Cost Productivity
Meteorological Data Reduction
Integrated Circuits
Optical Electronic Instrumentation
Miniature Electronic Equipment
CC Intelligence
Fluid Belt Combustors
Preparation of Radiation-Adhesive Bonding
CO_2 Lasers

Infrared Detections
Countermeasures
Maurick Warheads and Fuses
Target Detection
Lasers
Defects of Airfields
Electric Guns
Lasers
Tunnelling Technology
Landmine Warfare
Radar/Radio Frequency Detection
Archival Mass Memory
Air Warfare
Space-born Detection System
Psychological Impact of Retirement on Military Personnel
Teaching Methods and Training Devices
On-line Searching of Bibliographic Data
Warsaw Pact Political Vulnerability Study
Control Systems
Laser Effects
ADA (Computer Language)
Behind the Armored Debris
Defense Repression
Close Air Tactics
Training of Military Instructors
Army War College Thesis (Bibliography)
Command Control Communications Intelligence
Mines
Electromagnetic Pulse
Linear Shaped Charges
Mines in Urban Areas
Underwater Acoustics
Soviet Import Controls
Air to Air Missiles
Diving
Radar Cross-Section Studies
Synthetic Radar
Natural Language Processing
Command and Control
Chemical Warfare
Self-Forging Fragment Calculation
Aluminum Armor - Spelling to Fragmentation
Productivity
New Vessel Series (11) - 500-T Class
White Phosphorous
Tactical Nuclear Warfare
Software Cost Estimating
Military Preparedness in the Middle East
War Gaming Models
Item Identification - Personnel Management
Ground Shock and Soil Properties
Mathematical Programming
Logistics of the West German Army
Army Field Services
Contract Motivation
Coal Fuel Availability

Tactical Satellite Terminals
Development of an All-Metal, Thick Film, Cost-Effective Metallization for Solar Cells
Desert Water Problems
Weapon System Cost Growth
Africa
Cold Regions Engineering
Gyration
Determine Definition of Term "Milestones"
Productivity (Contractor)
Cost Analysis Related to Production-Engineering
Management Information Systems
Combat Maintenance Capability
Surfactants in Electrochemistry
Software
Job Enrichment
Built-in Test; Automatic Test Equipment
Logistics Policy and Planning
Helicopter Rotor Downwash
Rubber Materials
Statistical Sampling
Reliability
Chemical Agent Simulant
Strategic Metals (Materials)
Operations Research - Career Field
Protective Clothing
Instructional Technology
Truck Driving
Space Radiators
Imagery and Learning
Publications of Naval War College
Logistics Support 1982
Laser Target Designations

APPENDIX B

SURVEY METHODOLOGY

The DTIC survey was conducted by telephone. The questionnaires were administered to the respondents by DTIC interviewers using the intergovernmental telephone network. All users of DTIC were randomly sampled from one of two sources. For those responding to questions concerning technical reports, bibliographic searching, manual searching and CAB, users were sampled from a list of On-Demand Technical Report Orders for the period October 1981 through April 1982. A list of DTIC search requests was used to sample users of the Management Databanks: WUIS, R&DPP and IR&D. These users represented those that requested DTIC to conduct a search for them as well as those that performed the search personally.

Organizations that ordered 300 or more reports in either hard copy or microfiche were defined as large organizations and those with orders of less than 300 reports for the period were defined as small organizations for the purpose of this survey. In many cases the organization had more than one location that ordered reports. If the organization had at least one location with more than 300 reports ordered, then that and all other locations of that organization were defined as "large."

Approximately 80 percent of the technical reports users were identified by contacting the organization library or reports center, each of which provided names of approximately five DTIC technical reports users. Users were then contacted, and 80 percent responded to the questionnaire administered. The libraries and information centers were sampled from the Technical reports On-Demand requestor list.

Two main questionnaires were designed and adaptations of each were used for each group of nine respondents. The respondent groups were characterized by whether they were government or contractor, small or large organizations, and by the parts of the DTIC system they utilized: management databanks, technical reports, bibliographic searches, TAB, CAB and combinations of the above.

The users that were sampled from lists of technical report requestors were requested to report which parts of the DTIC system they utilized. Based on that the interviewer would administer the Technical Reports Questionnaire and one other questionnaire, either a (1) Bibliographic searching, (2) TAB, or (3) CAB. (See Appendix C for samples of questionnaires.) In total, responses were received from 315 individuals.

The management databanks respondents were queried much like the technical reports respondents. They were divided according to (1) government and contractors, (2) small and large organizations and (3) the management databank used. In this case the respondents were also divided between those that had requested DTIC to perform a search for them and those that had searched DTIC databases themselves. The databases covered in this survey were: (1) R&T Work Unit Information System (WUIS) Data Base describing research and technology projects currently in progress at the work unit level; (2) R&D Program Planning Data Base (R&DPP) describing program planning at the project and task levels and (3) the Independent Research and Development (IR&D) Data Bank. The respondents answered questions about one specific search within one databank. The number of respondents to the management databank questionnaires was 131.

Survey Instruments

Two main questionnaires were designed for the survey of, with multiple subquestionnaires which were combined to cover each respondent's usage of DTIC.

For the sample of on-demand technical reports requestors, an introductory questionnaire was administered to identify the parts of the DTIC system utilized (see Exhibit A). The users were whether they had used technical reports, management information reports, TAB and TAB indexes, CAB or performed bibliographic searches in the last year (summer 1981 - summer 1982). They were asked to estimate monthly uses, time spent on those individual uses, and the percentage of uses that were classified and

EXHIBIT A
IDENTIFICATION OF DTIC USAGE

	Product or Service	Used in Last Year Yes	Used in Last Year No	Average Monthly/ Yearly Uses (Specify)	Time Spent Using (Specify minutes or Hours)	Percent Classif	Percent Limited
I.	a. Technical Reports in Paper Copy	☐	☐	(Mo/Yr)	(Hrs/min)	%	%
I.	b. Technical Reports in Microfiche	☐	☐	(Mo/Yr)	(Hrs/min)	%	%
V.	c. Management Information Reports	☐	☐	(Mo/Yr)	(Hrs/min)		
if yes, to 2+, then → II, III or IV	d. TAB and TAB Indexes	☐	☐	(Mo/Yr)	(Hrs/min)		
if yes, to 2+, then → II, III or IV	e. CAB (Current Awareness Bibliographies)	☐	☐	(Mo/Yr)	(Hrs/min)		
if yes, to 2+, then → II, III or IV	f. Bibliographic Searching	☐	☐	(Mo/Yr)	(Hrs/min)		
if yes, to 2+, then → II, III or IV	f1. By your organization	☐	☐	(Mo/Yr)	(Hrs/min)		
if yes, to 2+, then → II, III or IV	f2. By DTIC	☐	☐	(Mo/Yr)	(Hrs/min)		

limited (of technical reports only). The DTIC product and service uses reported acted as a cue for interviewers in determining the subquestionnaires to be administered.

Question 2 of the introductory questionnaire reported other sources of information other than DTIC utilized by the respondent and aided in identifying the proportion of use compared to use of DTIC (see Exhibit B). Question 3 defined the work role of the respondents, which was important later in the analysis of the survey results.

The subquestionnaires focused on the respondent's last use of DTIC product or services and the characteristics and value of the information gathered through that request. In addition, the users were queried concerning the amount of time spent reading or searching, the source of physical access, and how the data gathered were applied to projects or tasks.

The possible combinations of the questionnaire were numerous and acted to define the respondents by their types of use of DTIC information. They also helped to link the types of use to the user's perceptions of the value of the data gathered using the DTIC products and services.

EXHIBIT B
OTHER SOURCES OF INFORMATION AND WORK ROLES IDENTIFICATION

2. We are also interested in your use of other sources of information. Please indicate your average monthly use and the time spent on the following:

	Average Monthly Uses	Time Spent Using/Month
a. Non-DOD technical reports	_____	_____mins./hrs.
b. Journal articles	_____	_____mins./hrs.
c. Other materials	_____	_____mins./hrs.

3. What is your primary work role within the organization, that is, what do you spend the largest proportion of your time doing?

a. Management ☐
b. Teaching ☐
c. Research ☐
d. Other ☐

APPENDIX C

DTIC SURVEY QUESTIONNAIRES

interviewer name:_____ name:_____

date of interview:_____ organization:_____

_____

_____

phone:( )_____

V. MANAGEMENT DATA BANK SURVEY

According to our records,

1) You searched

2) DTIC searched for you

from

a) the R&T Work Unit Data Bank

b) the R&D Program Planning Data Bank

c) the Independent R&D Data Bank

[within the last month. Could you please give us the name and telephone numer of ___ individuals for whom requests were made?]

INTRODUCTION

Hello, may I speak to _____?
(Name of person called)

Hello, this is (name of interviewer). I am with the Department of Defense Technical Information Center. We are making some inquiries in order to gather data concerning distribution of our products and services to libraries and information centers.

I would appreciate it if you would take a moment to answer several questions concerning this inquiry. Any information will be kept in strictest confidence (Defense Department #3507).

We understand that you recently received output from a search of

a) R&D Program Planning Data Bank (R&DPP)

b) R&T Work Unit Information System (WUIS) Data Bank

or c) Independent Research and Development (IR&D) Data Bank

The questions I am going to ask you are about that search output.

1. For what purpose did you request the search?_____

_____

2. Were the results useful for that purpose? Yes ___

No ___

Why?_____

_____

3. To the best of your knowledge, is the information you obtained:

complete Yes No Don't Know

4. Did you pass the information you obtained on to anyone else?

Yes

No How many people?_____

5. Has the information you obtained from the data bank saved you and/or your coworkers any time?

   Yes ☐

   No ☐

   Don't Know ☐

6. If we consider the average hourly wages of your staff workers times the hours of search time, what is the approximate dollar value of the time you and/or your co-workers saved? (Insert zero "0" if none.)

   _____

7. What, if any, were the dollar savings for other things such as equipment and supply costs? (Insert zero "0" if none.)

   _____

8. Could you describe how it saved you time?

   _____

   _____

   (Probe: What would you have had to do if you hadn't read that particular information?)

9. About how many times in the past have you used DTIC's management data bases?

   _____

10. How frequently do you expect to use the system in the future?

    _____

NAME: _____

ORG: _____

DTIC USER QUESTIONNAIRE

TITLE: _____

INTRODUCTION

PHONE: _____

Hello, may I speak to _____?
(Name of person called)

Hello, this is (name of interviewer). I am with the Department of Defense Technical Information Center. We are making some inquiries in order to gather data concerning distribution of our products and services to libraries and information centers.

I would appreciate it if you would take a moment to answer several questions concerning this inquiry. Any information will be kept in strictest confidence (Defense Department #3507).

1. We are interested in finding out about your use of defense related publications, particularly those distributed by DOD's Technical Information Center. I am going to read you a list of six products and services provided by DTIC. For each one, I would like to know: (1) whether you have used the product or service in the last year, (2) if yes, how many times you use the product monthly or yearly, (3) the number of hours you spend using the product or service in an average month or year, and (4)what proportion of this use is relative to classified materials and what proportion is relative to limited materials.(FOR CATEGORIES a.-b.)

	Product or Service	Used in Last Year Yes	Used in Last Year No	Average Monthly/ Yearly Uses (Specify)	Time Spent Using (Specify minutes or Hours)	Percent Classif	Percent Limited
I.	a. Technical Reports in Paper Copy	☐	☐	(Mo/Yr)	(Hrs/min)	%	%
	b. Technical Reports in Microfiche	☐	☐	(Mo/Yr)	(Hrs/min)	%	%
V.	c. Management Information Reports	☐	☐	(Mo/Yr)	(Hrs/min)		
if yes, to 2+, then → II, III or IV	d. TAB and TAB Indexes	☐	☐	(Mo/Yr)	(Hrs/min)		
	e. CAB (Current Awareness Bibliographies)	☐	☐	(Mo/Yr)	(Hrs/min)		
	f. Bibliographic Searching	☐	☐	(Mo/Yr)	(Hrs/min)		
	f1. By your organization	☐	☐	(Mo/Yr)	(Hrs/min)		
	f2. By DTIC	☐	☐	(Mo/Yr)	(Hrs/min)		

(IF RESPONDENT ANSWERS NO TO (a), (b), (d), (e), and (f), STOP AFTER Question 3.)

Can You tell us how many researchers (scientists and engineers) are in your organization?

_____

2. We are also interested in your use of other sources of information. Please indicate your average monthly use and the time spent on the following:

		Average Monthly Uses	Time Spent Using/Month
a.	Non-DOD technical reports	_____	_____mins./hrs.
b.	Journal articles	_____	_____mins./hrs.
c.	Other materials	_____	_____mins./hrs.

3. What is your primary work role within the organization, that is, what do you spend the largest proportion of your time doing?

a. Management ☐
b. Teaching ☐
c. Research ☐
d. Other ☐

I. TECHNICAL REPORT QUESTIONNAIRE

1. We are interested in your use of reports provided by DTIC. Can you tell us what report you read last?

   Title:_____

   (SPECIFY: FICHE___ or PAPER COPY___ AND CLASSIFIED___ UNCLASSIFIED/LIMITED____
   or UNCLASSIFIED/UNLIMITED____)

2. How did you initially find out about this technical report?

   It was routed to me..... 1

   From another person (i.e., a colleague)..... 2

   Cited in another report or journal article..... 3

   From an announcement publication which include:..... 4

   STAR___ TAB___ GRA&I___ OTHER (name)_____

   From CAB (Current Awareness Bibliography)..... 5

   From a Bibliographic Search..... 6

   Done by your organization ___

   Done by DTIC ___

   Other (describe)_____... 7

3. From which source did you obtain *physical access to this technical report*?

   It was sent to me via standard distribution..... 1

   It was sent to my Library/organization via standard distribution..... 2

   I ordered it..... 3

   My Library/organization ordered it..... 4

   Other_____... 5

4. How thoroughly did you read this report?

   With great care..... 1

   With attention to the main points..... 2

   Just to get the idea..... 3

5. To how many others did you recommend this report?_____

6. In which of the following ways have you used, or do you plan to use, the last report you read?

	Yes	No	Don't Know
To apply its findings to a current project.....	1	2	3
To apply its methodology to a current project...	1	2	3
In preparation of a research proposal.....	1	2	3
In preparation of an article, book, review, or report.....	1	2	3
As a citation in a journal article, book, review or report.....	1	2	3
For professional development, current awareness, or general interest.....	1	2	3
In preparation of a lecture or presentation.....	1	2	3
For the planning, budgeting and management of research.....	1	2	3
No use.....	1	2	3
Other (describe) _____....	1	2	3

7a. Has reading these reports saved you and/or your co-workers any time on any current task or project?

Yes..... 1
No..... 2
Don't Know..... 3

7b. What did you and your staff save as a result of that reading? _____

8. If you consider the amount of staff time devoted to searching for these materials and the average salary of the staff, what is the approximate dollar value of the time you and/or your co-workers saved?

(Insert zero "0" if none.) _____

9. What, if any, were the dollar savings for other things such as equipment and supply costs? (Insert zero "0" if none.) _____

10. Could you describe how it saved you time?

_____

_____

(Probe: What would you have had to do if you hadn't read that particular information?)

II. MANUAL SEARCH QUESTIONNAIRE

1. When was the last time you used TAB? _____

   What was it for: Browsing ☐ Problem-related search ☐

2. Did you personally perform the search, or was it performed for you?

   Performed search personally ☐

   Search was performed by someone else ☐ Who? _____

3. How much time did you spend on the search? _____

4a. How many items were identified? _____

 b. How many were: classified ☐

   unclassified/ limited ☐

   unclassified/unlimited ☐

5. To how many of these items did you physically obtain access (or intend to obtain access)?

   _____

6a. How many items did you read (scan beyond the title page)? _____

 b. How many of these items read were:

   Classified ___

   Unclassified/Limited ___

   Unclassified/Unlimited ___

7a. Has reading these reports saved you and/or your co-workers any time on any current task or project?

   Yes..... 1

   No..... 2

   Don't Know..... 3

7b. What did your staff save as a result of that reading? _____

8. Considering only direct salaries, what is the approximate dollar value of the time you and/or your co-workers saved? (Insert zero "0" if none.) _____

9. What, if any, were the dollar savings for other things such as equipment and supply costs? (Insert zero "0" if none.) _____

10. Could you describe how it saved you time?

_____

_____

(Probe: What would you have had to do if you hadn't read that particular information?)

III. BIBLIOGRAPHIC SEARCH QUESTIONNAIRE

1. What was the general subject of the last search of the DTIC data base you performed or had performed for you?

_____

2. What method of searching was used?

Search was performed by your organization ____

DTIC-Provided Searching ____

3. Did you personally perform the search, or was it performed for you?

Performed search personally

Search was performed by someone else By Whom?_____

4. How much time did you spend:

Requesting and/or conducting search _____

Reviewing search output _____

5. How many citations did you receive as output from the search? _____

6a. How many citations were relevant?_____
6b. How many were: classified___unclassified/limited___unclassified/unlimited____?

7. To how many of these items did you actually obtain access? _____

8a. How many items did you read? _____

b. How many items read were:

Classified _____

Unclassified/Limited _____

Unclassified/Unlimited_____

9. Has reading these reports saved you and/or your co-workers any time on any current task or project?

Yes..... 1

No..... 2

Don't Know..... 3

10. If we consider average salary of your staff workers times the amount of time they would spend searching, what is the approximate dollar value of the time you and/or your co-workers saved? (Insert zero "0" if none.)

_____

11. What, if any, were the dollar savings for other things such as equipment and supply costs? (Insert zero "0" if none.)

_____

12. Could you describe how it saved you time?

_____

_____

(Probe: What would you have had to do if you hadn't read that particular information?)

IV. CURRENT AWARENESS BIBLIOGRAPHY QUESTIONNAIRE

1. When did you last review a current awareness bibliography?

   _____

   How many were: classified__ unclassified/Limited__ unclassified/unlimited__

2. How many relevant citations did you identify?

   _____

3. How many reports did you request or plan to get? _____

4. How many items did you read? _____

5. How many of the reports requested were:

   Classified _____

   Unclassified/Limited _____

   Unclassified/Unlimited _____

6. Has reading these reports saved you and/or your co-workers any time on any current task or project?

   Yes..... 1

   No..... 2

   Don't Know..... 3

7. If we consider the average staff worker's salary and the time saved x number of staff, what is the approximate dollar value of the time you and/or your co-workers saved? (Insert zero "0" if none.)
   $ _____

8. What, if any, were the dollar savings for other things such as equipment and supply costs? (Insert zero "0" if none.)

   _____

9. Could you describe how it saved you time?

   _____

   _____

   (Probe: What would you have had to do if you hadn't read this particular information?)

SUPPLEMENTARY

INFORMATION

ERRATA

AD-A130 805

Page 9 refers to Chapter 5. There is no Chapter 5 .

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19. ABSTRACT (Continue on reverse if necessary and identify by block number)

This report describes the use and value of the major information products and services provided by the Defense Technical Information Center (DTIC). The products and services considered include technical report distribution on an on demand-basis and through the Automatic Document Distribution (ADD) program; secondary information dissemination through online searching of the Technical Reports (TR) data base, Current Awareness Bibliographies (CAB), and Technical Abstract Bulletins (TAB); and provision of management information from three management data banks. The amount and kinds of use of each of these products and services is addressed, as is the value associated with use.

Study findings establish significant levels of value associated with the provisions of DTIC products and services. There are substantial readings of DoD technical reports, with about 12.4 million such readings estimated for 1982. The savings value associated with an individual reading -- $4,600 on the average -- is high. The total value to the Department

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of Defense, reflecting only those readings coming through DTIC bibliographic products, is $37.5 billion. This suggests a considerable return on the investment in DTIC's information products and services.